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JAN 25 1938 PLANT INDUSTRY

CEREAL COURIER

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 January 10, 1938 No. 1

Personnel (Dec. 11-Jan. 10) and Field Station (Dec. 1-31)

PERSONNEL ITEMS

Mr. Karl F. Finney came to Washington, D. C., from Columbus, Ohio, on January 4 to spend about a month in the Milling and Baking Laboratory of the Department in order to familiarize himself with methods and procedure in preparation for experimentation in the Wheat Quality Laboratory at Manhattan, Kans., where he will be stationed after about February 1.

Dr. M. A. McCall and Dr. M. T. Jenkins were in La Fayette, Ind., December 15 to confer with officials of the Purdue University Agricultural Experiment Station and personnel of the Division regarding plans and organization of cooperative work with corn.

Dr. L. F. Randolph left Ithaca, N. Y., on January 7 for Canal Point, Florida, where he has a planting of his genetic stocks of corn in connection with the general winter planting of corn at the U. S. Sugar Plant Field Station. He will make sporocyte examinations on a number of his stocks and hand-pollinations in others. Dr. Randolph will come to Washington for a week or 10 days on his return from Florida to New York State.

Dr. S. C. Salmon left Washington on January 8 for Manhattan, Kans., to confer with officials of the Kansas Agricultural Experiment Station on the Hard Winter Wheat Milling Laboratory. He also will go to Ames, Iowa, in the interest of cooperative wheat research.

Mr. Coit A. Suneson arrived from Davis, Calif., on January 3 to spend about six weeks in the preparation of annual reports and in the formation of plans for next season's wheat work in the Western Region and at Davis. He will also spend some time in the Milling and Baking Laboratory of the Department to become familiar with methods of determining quality and with results obtained with varieties of wheat grown in the Western Region.

RECENT PUBLICATIONS

Physiologic Races of Ustilago hordei. V. F. Tapke. Jour. Agr. Research 55(9): 683-692. November 1, 1937. (Investigations conducted cooperatively by the Division of Cereal Crops and Diseases and the New York (Cornell) and North Carolina agricultural experiment stations.)

Inheritance of Resistance to Loose and Covered Smuts in Oat Hybrids. George M. Reed and T. R. Stanton. Jour. Amer. Soc. Agron. 29(12): 997-1006. December 1937. (Cooperative investigations of the Division of Cereal Crops and Diseases and the Brooklyn Botanic Garden.)

Registration of Improved Wheat Varieties, XI. J. Allen Clark. Jour. Amer. Soc. Agron. 29(12): 1031-1032. December 1937.

The Genus Phytomonas. Charlotte Elliott. (Phytopath. Note) Phytopathology 27(12): 1181-1182. December 1937.

When to Cut Rice. W. D. Smith and Jenkin W. Jones. U. S. Dept. Agr. Leaflet 148, 5 pp. December 1937. (Cooperation between Bureau of Agricultural Economics and Division of Cereal Crops and Diseases, Bureau of Plant Industry.

COPY

OFFICE OF PERSONNEL

December 13, 1937.

MEMORANDUM FOR MR. H. E. ALLANSON
Bureau of Plant Industry.

Dear Mr. Allanson:

Reference is made to your memorandum of December 7 concerning the recent amendment to the regulations of the U. S. Employees' Compensation Commission, prohibiting the disclosure of information pertaining to claims arising from injuries in which the United States has an interest.

The U. S. Employees' Compensation Commission informally advised the Department that this prohibition is applicable when an employee becomes subject to the provisions of the Employees' Compensation Act as the result of an injury in line of duty and it is found, after an investigation, that a person, or persons, not connected with the Federal government is responsible for the accident, that is, a third person--to use the terminology of the Commission. As a result of the findings of the Commission it may be necessary for the U. S. Government to take legal action with a view to recovering damages from the so-called third person, and in such cases, it is essential that no records, statements of witnesses, or other papers pertaining to the case be made available to any one other than the duly authorized representatives of the U. S. Employees' Compensation Commission.

The U. S. Employees' Compensation Commission states that it is not their intention to prohibit employees of the Federal government who are covered by liability insurance from reporting accidents in which they are involved to their insurance company or to law enforcement authorities. In fact, it is mandatory that they do so immediately, and the Commission further states that if after a thorough investigation by their represenatives, information other than that reported by the employee is disclosed, copy of such information will be made available to interested parties, such as the law enforcement agency or the insurance company.

Very truly yours,

S. B. Herrell,
Chief, Division of Appointments.

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

TEXAS

SUBSTATION NO. 6, DENTON (Wheat Improvement, I. M. Atkins) (Dec. 31)

The weather in December was very disagreeable. The precipitation amounted to 4.54 inches, or 2.0 inches above normal. Although precipitation occurred on only 12 days, 23 days were cloudy and only 7 days were clear. Temperatures were below normal the first of the month but much above normal during the last two weeks. The record of 23 days cloudy sets an all time record for cloudy days in December. Precipitation for the year just closed is 6.66 inch below normal.

The warm weather of the past two weeks with the frequent rains has caused all small grain to come out of dormancy and start rapid growth. Fields have been too muddy to pasture small grain so that with the rapid growth and not being pastured, it is in a hazardous condition from the standpoint of freezes. At the first of the month small grain was well hardened because of cold weather in November and the first few days of December.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Grain Sorghum and Broomcorn, J. B. Sieglinger) (Jan. 3)

Grain from the sorghum plots was recleaned and weighed. Results of the date-varietal experiments were as follows:

Variety	Yield in bushels 1/ (56 lb.) per acre		
	June 8 seeding	June 22 seeding	Av. of 2 dates
Dwarf milo	19.3	21.3	20.3
Finney milo	12.9	18.3	15.6
Beaver milo	5.4	13.5	9.4
Wheatland milo	12.2	14.9	13.6
Feterita	6.5	8.4	8.0
Spur feterita	8.2	14.1	11.2
Dwarf hegari	3.1	1.7	2.4
Chiltex	7.9	22.9	15.4
Ajax	10.5	8.7	9.6
Club kafir	8.0	14.7	11.4
Sedan Red kafir	13.1	19.6	16.3
Sol kafir	22.1 2/	26.7	24.4
Sunrise kafir	9.6	23.6	16.6
Atlas	10.6	13.5	12.0
Reed kafir	16.0	30.3	23.1
Hydro kafir	14.2	21.0	17.6
Sharon kafir	16.8	30.8	23.8
Standard kafir	24.0	27.6	25.8
Bishop kafir	21.0	24.2	22.5
White darso	13.6	18.5	16.0
Darso	11.4	11.4	11.4

1/ Each yield figure is the average of 2 guarded 1/47-acre plots.

2/ Replanted June 16, with old seed.

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (Jan. 3)

Temperatures from November 16 until the middle of December were cool enough to stop nearly all cereal growth. During the last two weeks of December some growth was evident even though the temperatures dropped below freezing most every night. These warmer days are causing the buds of Chinese elms to swell.

November 15 seedings of winter wheat emerged to good stands on December 30 which was the longest germination period for that seeding in the past eight years. Earlier seeding emerged with comparative promptness though any seedings made after October 1 have not made sufficient ground cover to prevent danger from soil blowing.

Nursery materials as a whole are satisfactory. A few tender strains of winter wheat, oats, and barley appear to have been killed by freezes.

The rainfall in December was 0.40 inch. The total precipitation for 1937 was 18.13 inches; 0.30 and 4.75 inches, respectively, below the 23-year average at this station. The maximum, minimum, and mean temperatures for December were 63° on December 30, 12° on December 5, and 34°, respectively.

KANSAS

AGRICULTURAL EXPERIMENT STATION, MANHATTAN (Wheat Leaf Rust, C. O. Johnston) (Dec. 23)

Except for the past week, which has been mild, December has been an exceptionally cold month in Kansas. The temperature at Manhattan reached a minimum of 2° below zero on December 10, and it was only a few degrees warmer on several other days. Snow, sleet, or rain fell on four occasions but the moisture provided each time was very scant. Rain and sleet on December 12 froze as it fell to form a glaze of ice on everything. This condition persisted until December 16, when most of the ice melted.

The rust nursery was visited on December 2, 10, and 17. On the last two dates it was noted that there were many evidences of cold injury to nonhardy winter wheats. Many selections in several crosses involving spring or tender winter varieties already are seriously injured by cold and several are dead. The difference in leaf color between injured rows and the hardy parental check rows is very striking. The injured rows are brown and lifeless, while the checks are a normal healthy green. The amount of cold injury seems greater this year than usual and many rows of space hybrids seem to have been lost already.

Leaf rust experiments in the greenhouse are proceeding at a normal pace. The determination of the physiologic race content of collections made in the western Mississippi basin last spring is under way but many collections have failed to yield cultures, probably owing to improper temperatures in the storage refrigerator. Many promising hybrid lines of winter wheat an many foreign introductions are being given seedling rust tests with physiologic races 9 and 15 of leaf rust. A recent test of about 50 of the most promising Hope x Kawvale lines from the 1937 rust nursery revealed that many were highly resistant to race 9 but only a few exhibited resistance to race 15. Nearly all of the lines exhibited considerable resistance in the presence of both races in the nursery last spring, so it may be assumed that they have at least mature plant resistance to race 15.

NEBRASKA

AGRICULTURAL EXPERIMENT STATION, LINCOLN (Wheat Improvement, K. S. Quisenberry) (Jan. 3)

According to data published by the Weather Bureau the total precipitation for 1937 at Lincoln amounted to 19.36 inches, which was 7.87 below normal, or the sixth consecutive year with subnormal precipitation. This continuation of dry weather has caused a tremendous loss of trees in Lincoln and vicinity. This winter, as last, crews of men are working along the city streets removing large numbers of dead trees.

Winter wheat in both plots and nursery looks rather bad at this time. Temperature as low as zero early in December with no covering of snow caused killing in the more tender strains. In the eastern winter-hardiness nursery varieties such as Redhart and Purplestraw appear to be nearly dead. Some dead plants can be found in plots of Tenmarq, and Kawvale looks very brown. All winter barley is dead. Because of late seeding little or no tillering occurred before cold weather set in. With very little growth and with the ground very dry there is danger of soil blowing in case of continued drought or periods of high wind.

Reports from the western part of the State are more encouraging, indicating that wheat is in better condition than it is near Lincoln. The condition of wheat in the State in general is reported as better than last year, although nearly all areas are in need of moisture. In some areas wheat fields have been pastured very heavily.

The nursery and plots at North Platte are reported to be in good shape. There has been a heavy growth which may be a disadvantage in case more moisture is not obtained soon. As yet there seems to be little sign of winter-killing.

The controlled freezing work at Lincoln is nearly completed for the winter. Some fairly good data have been obtained but for the most part the results have not been so satisfactory as last year. A large number of boxes of material were ruined by the early cold spells coming before the plants had been sufficiently hardened. A number of the rust-resistant Cheyenne x Hope and Turkey selection x Hope lines have been tested; most of them lack the hardiness of the winter parent.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (Jan. 3)

Climatic conditions in December were about average. The mean temperature was 13°, the same as the average for the past 24 years. The maximum temperature was 44° on Dec. 2 and the minimum -19° on Dec. 23. Mild temperatures have prevailed during the past few days and some thawing has occurred so that some of the hillsides are practically bare of snow. The precipitation in December was 0.63 inch, which is a little above average.

Climatic averages for the entire year also corresponded closely with the 24-year averages. The total precipitation for the year was 16.09 inches, which is 0.9 inch more than the average for the past 24 years but 0.37 inch less than the 63-year average, which includes the precipitation at Bismarck from 1875 to 1913.

Threshing of the flax nursery, suspended temporarily to permit concentrated work on manuscripts and tabulation of wheat data, has been resumed and will soon be completed. Tabulation and typing of wheat data tables for the annual report are nearly completed.

OREGON

PENDLETON FIELD STATION, PENDLETON (Cereal Agronomy, J. F. Martin) (Jan. 3)

All crops, including weeds, have emerged with excellent stands. Emergence was slow and irregular because of poor moisture conditions at seeding time, but adequate rains and moderate temperatures have permitted the development of the most uniform stands in several years.

The total precipitation for the calendar year 1937 was 18.55 inches; for 1936 it was 11.68 inches. The normal is 13.03 inches. There were 2.31 inches in December, mostly in the form of rain, compared with a normal of 1.94 inches.

UTAH

AGRICULTURAL EXPERIMENT STATION, LOGAN (Cereal Agronomy, R. W. Woodward) (Dec. 16)

Unusually mild weather continued through November and the first half of December. The precipitation totaled 2.39 inches. For the first half of December it was 1.48 inches. All the moisture has come in the form of warm rains. This is the first season on record where no snow has fallen on the valley floors of northern Utah later than December 8. Many of the lawns are still green and occasional dandelions are still in bloom.

Winter wheat appears to be in better condition than for many years. Seedings made as late as November have emerged to good stands.

The writer anticipates spending the winter at the University of Minnesota.

CALIFORNIA

BIGGS RICE FIELD STATION, BIGGS (Rice Agronomy, L. L. Davis) (Jan. 3)

California produced the largest rice crop in the history of the state in 1937 with 10,150,000 bushels on 145,000 acres. It is privately estimated, however, that because of unfavorable weather 2,000,000 bushels were not harvested or if harvested are not suitable for milling owing to weather damage.

The rainfall in 1937 was 30.1 inches. The 24-year average, 1913 to 1936, inclusive, is 19.2 inches. November was one of the wettest on record, 6.11 inches of rain having been recorded.

Harvesting and threshing on the station were completed before the heavy rains. The yields in general were good. The yields of varieties in field and nursery plots were only fair.

The following table gives the average yields of Caloro rice grown in the fertilizer plots, in 1937:

Treatment	Yield per acre Av. of 9 plots (Lbs.)
Ammonia sulphate	6,005
Urea	5,690
NH_3 (liquid ammonia)	5,637
Ammophos	5,612
Nitrophosko	5,550
Calurea	5,507
Cal-Nitro (1/2 nitrate, 1/2 ammonia)	5,363
Cyanamid	5,350
Unfertilized (av. 18 plots)	4,758

ARIZONA

AGRICULTURAL EXPERIMENT STATION, TUCSON (Cereal Agronomy, A. T. Bartel) (Jan. 7)

The weather in December was unusually warm. The first killing frost of the season occurred on the 19th or a month later than normal. There were only three days in which freezing temperatures were recorded. The mean temperature was 54.3° as compared with the normal of 50°. The precipitation for the month was 0.67 inch.

The seedings at the Salt River Valley Experiment Farm at Mesa were made the first part of December. All the seedings at Tucson have been completed.

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C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 February 10, 1938 No. 2

Personnel (Jan. 11-Feb. 10) and Field Station (Jan. 1-31)

PERSONNEL ITEMS

Dr. Mark A. Barmore was appointed February 1, 1938, as Agent in the cooperative milling and baking research program conducted at the Hard Red Winter Wheat Quality Laboratory at Manhattan, Kans. He came to Washington February 9 to confer with members of the Division staff concerning this program.

Mr. Jenkin W. Jones left Washington February 5 to spend two weeks in Louisiana, Texas, and Arkansas to confer with officials of the Department and of the agricultural experiment stations in these States regarding the cooperative program on rice production and improvement.

Dr. K. S. Quisenberry came to Washington January 21 to prepare manuscripts for publication and to confer with personnel of the Division regarding plans for wheat survey and wheat research. He left for his headquarters at Lincoln, Nebr., on February 9.

Mr. T. R. Stanton attended the Thirty-Ninth Annual Convention of the Association of Southern Agricultural Workers held at Atlanta, Ga., Feb. 2, 3, and 4, where he read a paper entitled "Progress in Oat Breeding for the South" before the Crops Division.

Approximately 2,000 workers were in attendance and many interesting and excellent papers were presented. Those dealing with cotton, cereal, and forage crops breeding, developing and handling permanent pastures, fertilizers and their application, and soil conservation in general were of most interest.

Mr. D. E. Stephens arrived in Washington on January 21 for a 6 weeks' stay to confer with Department officials on cooperative cereal research in Oregon and to prepare manuscripts for publication.

Mr. G. H. Stringfield came to Washington February 1 to confer with personnel of the Division with regard to cooperative corn research in Ohio. He will be here about a month.

Mr. F. L. Timmons is in Washington to confer with personnel of the Division on cooperative weed research in Kansas.

RECENT PUBLICATIONS

Purification of Tobacco Mosaic Virus and Production of Mesomorphic Fibers by Treatment with Trypsin. Lawrence F. Martin, H. H. McKinney, and L. W. Boyle. Science 86(2234): 380-381. October 22, 1937.

Proso or Hog Millet. J. J. Curtis, J. F. Brandon, and D. W. Robertson. Colo. Agr. Expt. Sta. Bull. 438, 16 pp., 4 figs. November 1937. (Cereal experiments at the U. S. Dry-Land Field Station, Akron, Colo., in cooperation with the Division of Dry-Land Agriculture and the Colorado Agricultural Experiment Station.)

Corn Hybrids for 1938. Be Sure of Adapted Hybrids. R. D. Lewis and G. H. Stringfield. Ohio Farm Bureau News 17(4): 14-15. November 1937. (Cooperation between the Division of Cereal Crops and Diseases and the Ohio State University and the Ohio Agricultural Experiment Station.)

Influence of Climatological Factors in the Development of Cercosporella Foot Rot of Winter Wheat. Roderick Sprague. U. S. Dept. Agr. Circ. 451, 40 pp., 15 figs. November 1937. (Cooperative investigations of the Division of Cereal Crops and Diseases and the Oregon, Washington, and Idaho agricultural experiment stations.)

Comparative Reaction of Oat Varieties in the Seedling and Maturing Stages to Physiologic Races of Puccinia graminis avenae, and the Distribution of These Races in the United States. M. N. Levine and D. C. Smith. Jour. Agr. Research 55(10): 713-729, pls. 1-3. November 15, 1937. (G-1067) (Joint contribution of the Division of Cereal Crops and Diseases and the Division of Plant Pathology and Botany and the Division of Agronomy and Plant Genetics, State Agricultural Experiment Station, University of Minnesota.)

Comparative Toxicity of Selenates and Selenites to Wheat. Annie M. Hurd-Karrer. Amer. Jour. Bot. 24(10): 720-723, illus. December 1937.

Reaction of F_3 Progenies of an Oro x Turkey-Florence Cross to Two Physiologic Races of Tilletia tritici and One of T. levis. O. A. Vogel and C. S. Holton. Jour. Amer. Soc. Agron. 30(1): 55-59. January 1938. (Cooperative investigations of the Division of Cereal Crops and Diseases and the Agricultural Experiment Station, State College of Washington, Pullman, Wash.)

Root Studies of Four Varieties of Spring Wheat. V. C. Hubbard. Jour. Amer. Soc. Agron. 30(1): 60-62. January 1938. (Cooperation between the Division of Cereal Crops and Diseases and the Division of Dry-Land Agriculture at the Northern Great Plains Field Station, Mandan, N. Dak.)

Gill Fungi Associated with the Roots of Cereals. Roderick Sprague. (Phytopath. Note) Phytopathology 28(1): 78-79, fig. 1. January 1938. (Cooperative investigations by the Division of Cereal Crops and Diseases and the Oregon Agricultural Experiment Station.)

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C.

January 17, 1938

MEMORANDUM NO. 745

Attention is directed to the fact that letters referred from the White House to this Department shall not be published in whole or in part. It is not to be permissible for writers to quote from any of these letters.

H. A. Wallace
Secretary

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

LOUISIANA

RICE EXPERIMENT STATION, CROWLEY (Rice Agronomy, J. M. Jenkins) (Feb. 4)

Weather conditions in January were much more extreme than in January 1937. Rather warm weather prevailed during the first three weeks. The lowest temperatures occurred in the last week.

The maximum temperature of 78° was about the same as last year; the minimum of 29° was 12° lower than last year. The average mean temperature was 53°, or 7° less than for January 1937.

The total precipitation of 4.68 inches is 5.05 inches less than that of last year and 0.63 inch less than the 27-year average for January.

The field work on the Station included mainly the cleaning of ditches and the construction and repairing of drains.

On January 28 a program was held at the Station for the county agents of the rice area of the State. In addition to the county agents, the Director of Extension and other administrative officers were present. The program was given for the purpose of acquainting the members of the Extension Department with the work of the Station and the results obtained. About 20 men were present. Director C. T. Dowell was chairman.

"Estimate of the Rice Crop for the Year 1937," issued by the Rice Millers' Association December 11, 1937, gives the following information regarding Rexoro, Fortuna, and Nira rices:

Variety	Acres	Production (Bbls.)
Rexoro	53,727	698,542
Fortuna	24,218	293,278
Nira	22,472	294,893
Total	100,417	1,286,713

TEXAS

SUBSTATION NO. 6, DENTON (Wheat Improvement, I. M. Atkins) (Feb. 1)

The clear, warm, open weather which started the last of December continued throughout most of the month. The mean temperature for the month was 47.6°, or 3.3° above normal. The minimum was 16° on the 31st. A maximum of 78° was recorded on the 16th. The precipitation amounted to 3.29 inches, which is 0.92 inch above normal. Eighteen days were clear, 5 partly cloudy, and 8 cloudy.

Due to the warm, open weather of the past month, all small grains are growing rapidly and fruit buds have swelled in some instances. A norther on the 31st with a minimum of 16° has checked growth and appears to have done some damage to certain tender fall-sown oats. The extent of the damage cannot be learned until growth is resumed.

Seeding of the spring oats nursery and varietal tests was started today.

Word received from the west Texas experimental seedings indicate that except at Amarillo, where the nursery was irrigated following seeding, wheat is seriously in need of moisture. The experimental nursery and varietal test at Amarillo is in excellent condition but rabbits have started working on the crop. Instructions were sent to the County Agent to place poisoned salt in the field to prevent serious damage.

KANSAS

AGRICULTURAL EXPERIMENT STATION, MANHATTAN (Wheat Leaf Rust, C. O. Johnston) (Jan. 25)

Winter wheat in Kansas made little change in condition in December and the first 3 weeks of January. The weather remained fair, mild, and extremely dry throughout the period. At Manhattan, the first appreciable precipitation in 6 weeks fell in showers totaling 0.18 inch on January 23. Immediately following this moisture a high north wind and a rather slow drop in temperature ensued. A wind of high velocity, carrying much dust, has been blowing continuously for the past 48 hours. The temperature dropped so slowly during the first 18 hours of the storm that much surface moisture resulting from the rain was lost.

Temperatures at Manhattan have been moderate for the past three weeks, reaching a maximum of 63° on January 22. From that point the temperature declined gradually to a minimum of 8° this morning. Following such a long mild period this drop in temperature may result in some injury to winter wheat.

The last report on the acreage of winter wheat sown in the Southwest credits Kansas with 17,446,000 acres--about 900,000 acres more than were sown in the fall of 1936. In the writer's opinion that figure is too high but it certainly is true that an enormous acreage was sown. The December 1 condition of the crop was estimated at 73 percent of normal, while the condition of the 1937 crop was 80 percent on the same date a year ago. Continued drought has caused a deterioration of much wheat in the western half of the State, and frequent severe dust storms in that area during January have increased the apprehensions of many concerning the 1938 crop. Even in eastern Kansas moisture has been so deficient that many farmers have been hauling water for livestock and household purposes. A recent news article pointed out the fact that the accumulated deficiency in rainfall for the Kansas City area for the 8-year period 1930 to 1937 was exactly 6 feet.

The mild weather of the past two weeks permitted the taking of frost injury notes on 2,500 rows of winter wheat growing in the rust nursery. Wide differences in the amount of injury were recorded and it was observed that many rust-resistant hybrid lines were lacking in hardiness. However, nearly all of the most promising crosses contained at least a few hardy lines. Spring wheats and F_1 plants of winter x spring crosses in the greenhouse are now heading and are being given a final rust test. Physiologic race determinations also are approaching their peak and should be nearly complete in another month.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (Feb. 1)

Mild weather prevailed during most of January. The mean temperature for the month was 11°, which is 3° higher than the average January mean. The average wind velocity for January was only 5.1 miles per hour. The wind velocity for January in the past 24 years averaged lower than this only in five of the years. The maximum temperature was 41° on the 22d and the minimum -24° on the 29th. Precipitation in January was only 0.30 inch, which is a little below average. On account of the low wind velocity there has been little drifting so that the snow is more evenly distributed over the ground than usual.

Threshing of the flax nursery is completed but some selection material still remains to be classified and threshed.

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (Feb. 3)

The weather in January was comparatively mild, with a minimum of wind and stormy days, and a mean temperature somewhat above normal. The fields have a fairly uniform covering of snow. If February and March have normal precipitation there should be enough soil moisture at seeding time to insure germination of seed. Some of the country roads have been blocked with snow but the main roads have been kept open most of the time.

The mean temperature for January was 15.2° or nearly 5° above normal. The maximum was 42° and the minimum 27° below zero on the 30th. The precipitation was 0.99 inch, or more than twice the normal for January.

MAR 22 1938
BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 March 10, 1938 No. 3

Personnel (Feb. 11 - Mar. 10) and Field Station (Feb. 1 - 28)

PERSONNEL ITEMS

Dr. H. V. Harlan left Washington March 1 for his annual visit to the barley districts in Arizona, California, and Idaho. En route he stopped at Chicago to confer with members of the malting trade.

Mr. P. E. Hoppe spent two weeks in Washington, beginning February 23, conferring with officials of the Division regarding corn research.

Dr. M. T. Jenkins left Washington March 6 for Tennessee and Louisiana to confer with officials of the agricultural experiment stations and Division personnel regarding cooperative corn improvement investigations.

Mr. R. W. Leukel recently spent four days in Fayetteville, Tenn., to study the construction and operation of equipment designed for the chlorine treatment of wheat seed to prevent smut.

Dr. M. N. Levine came to Washington February 23 to confer with officials of the Division and to prepare manuscripts on uniform rust nursery studies on wheat and oats.

Dr. L. F. Randolph arrived in Washington March 4 to confer with officials of the Division on cooperative corn research and to prepare manuscripts for publication.

RECENT PUBLICATIONS

Resistance of Sorghums to the Chinch Bug. Ralph O. Snelling, Reginald H. Painter, John H. Parker, and W. M. Osborn. U. S. Dept. Agr. Tech. Bull. 585, 56 pp., 1 pl., 15 figs. December 1937. (Cooperative investigations between the Division of Cereal Crops and Diseases and the Kansas Agricultural Experiment Station.)

Illinois Corn Performance Tests, 1937. G. H. Dungan, R. O. Snelling, W. J. Mumm, J. H. Bigger, and A. L. Lang. Ill. Agr. Expt. Sta. Bull. 440: 351-395. January 1938. (Cooperation between the Illinois Agricultural Experiment Station and the Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Dept. of Agriculture, and the Illinois State Natural History Survey.)

Crystallization of tobacco-mosaic virus protein. H. H. Thornberry. Science 87: 91-92. January 28, 1938.

Cooperative Production of Foundation Stocks for Certified Corn Hybrids in Ohio. R. D. Lewis and G. H. Stringfield. Jour. Amer. Soc. Agron. 30(2): 145-149, 1 fig. February 1938. (Cooperative investigations of the Ohio State University and the Ohio Agricultural Experiment Station and the Division of Cereal Crops and Diseases.)

Preferences for Certain Genetic Strains of Corn Exhibited by Animals. E. Roberts, J. R. Holbert, and J. H. Quisenberry. Jour. Amer. Soc. Agron. 30(2): 150-159, figs. 1-4. February 1938. (Cooperative investigation between the Illinois Agricultural Experiment Station and the Division of Cereal Crops and Diseases.)

A Simple Machine for Cleaning Small Grain Nursery Samples. V. C. Hubbard. (Note) Jour. Amer. Soc. Agron. 30(2): 164-165, 1 fig. February 1938.

Local Virus Infections in Relation to Leaf Epidermal Cells. L. W. Boyle and H. H. McKinney. Phytopathology 28(2): 114-122. February 1938.

Observations on the Loose Kernel Smut of Johnson Grass. C. O. Johnston, C. L. Lefebvre, and E. D. Hansing. (Phytopath. Note) Phytopathology 28(2): 151-152, fig. 1. February 1938.

The 1937 Iowa Corn Yield Test. Joe L. Robinson, R. C. Eckhardt, M. M. Rhoades, and M. S. Zuber. Iowa Agr. Expt. Sta. Bull. 370: [378]-436, fig. 1. February 1938. (The Iowa Corn Yield Test is conducted by the Iowa Corn and Small Grain Growers' Association in cooperation with the Farm Crops Subsection, Iowa Agricultural Experiment Station, and the Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture.)

Beginning with the April 10 issue of the Cereal Courier the numbers will appear twice a month until December 10.

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF DIRECTOR OF PERSONNEL
Washington, D. C.

February 2, 1938.

MEMORANDUM FOR CHIEFS OF BUREAUS AND OFFICES

There is quoted below for your information and guidance a letter dated January 28, 1938, from the Acting Executive Director of the National Emergency Council to the Secretary of Agriculture:

"The President has approved the following schedule of holidays affecting Federal employees during the remainder of the calendar year 1938:

February 22	September 5
May 30	November 24
July 4	December 26

"Inasmuch as Christmas this year and New Year's day, 1939, fall on Sunday, the morning half days of December 24 and December 31 will be included in the above schedule of holidays."

(Signed) P. L. Gladmon
Assistant Director of Personnel.

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF BUDGET AND FINANCE
Washington, D. C.

February 17, 1938.

Budget and Finance Circular No. 65

Replying to telegrams of private individuals requesting information

The records indicate that the Bureaus of the Department are receiving an appreciable number of telegrams, originating with private individuals, corporations, etc., and containing requests for information, which conclude with either "Wire by Western Union" or "Wire by Postal Telegraph."

In this connection it appears that the concluding sentences heretofore mentioned are placed in the telegrams by the respective companies with or without the knowledge or consent of the sender, but that in no instance was the sender charged with the additional words. It further appears that in some instances it has been the practice to reply to such telegrams with telegrams sent at Government expense. Such a procedure represents an improper use of public funds.

Hereafter, any telegram which originated with an individual, corporation, etc., and contains a request for information should be answered by letter, unless the telegram to which reply is being made includes a request, such as "Reply by Western Union Collect", or the desire of the sender to receive a reply by telegram may be deduced from the contents of such telegram. In both instances the reply shall be sent at commercial rates -- collect.

This circular does not supplement any specific provision of the Regulations of the Department, but the requirements of regulations 1681, 1682, and 1684 should be considered.

H. A. Nelson
Acting Director of Finance.

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

IOWA

AGRICULTURAL EXPERIMENT STATION, AMES (Corn Breeding, A. A. Bryan) (Feb. 7)

For the corn-breeding program the season of 1937 was comparable to that of 1933. About 30,000 hand pollinations were made and generally satisfactory yields of seed were obtained. The fall was excellent for maturing high quality seed. Several germination tests show the seed to have high viability.

The yields obtained in the comparative trials were very good but some comparisons were made unsatisfactory by poor stands, the cause of which is not explained fully. For example, two top-cross experiments consisted of comparisons among parent lines and lines recovered after backcrossing one or more times to the recurrent parent and selfing one or more times. The recovered lines, with few exceptions, had good stands whereas several of the parent lines had very poor stands. All the seed was produced in 1936; it was well matured and was harvested before any frost. It seems possible that the seed of the recovered lines, less inbred than the parent lines, had more vigor with consequent better germination and seedling survival.

In the Jan. 10, 1937, issue of the Cereal Courier the writer reported estimates of hybrid corn seed production for the years 1932 to 1936, inclusive, together with probable acreages planted with hybrid seed and the proportion of Station hybrid seed. The writer regrets very much that he misunderstood the figures obtained from Dr. Joe L. Robinson and takes this opportunity to correct them and include figures for 1937. The estimated seed production and the probable acreage planted with hybrid seed are shown in table 1.

Table 1. - Estimated hybrid corn seed production and probable acreage planted with hybrid seed in Iowa in the years 1932 to 1937, inclusive

Year	Seed production	Acreage planted	Total acreage
	(Bu.)		(Percent)
1932	5,000	----	----
1933	20,000	35,000	0.35
1934	44.000	140,000	1.4
1935	75,000	308,000	3.1
1936	185,000	525,000	5.3
1937	650,000 ?	1,295,000	13.0
1938	----	4,550,000 ?	45.5 ?

It must be stated that the estimated 1937 production is a very rough figure. It is fairly certain that the acreage inspected for certification represents somewhat less than one-half of the total acreage devoted to hybrid seed production, and the acreage not inspected can only be guessed.

The acreage inspected for certification and the proportion of this acreage producing seed of Station hybrids are shown in table 2. (This corrects the error in the issue of January 10, 1937.)

Table 2. - Hybrid corn seed producing acreage inspected for certification in the years 1932 to 1937, inclusive, and the proportion of this acreage producing seed of Station hybrids

Year	Acreage inspected for certification	
	All hybrids	Station hybrids
	(Acres)	(Percent)
1932	218	5
1933	606	6
1934	3699	22
1935	4248	9
1936	5513	14
1937	6724	71

In addition to the acreage included in table 2 more than 1,000 acres were inspected for Illinois' certifying agency, making the total acreage inspected nearly 8,000.

The data in tables 1 and 2 were supplied by Dr. Joe L. Robinson.

TEXAS

AGRICULTURAL EXPERIMENT STATION, COLLEGE STATION (Wheat Improvement, E. S. McFadden) (Mar. 2)

A very mild winter with an abundance of moisture has been experienced in this part of Texas. Only one freeze hard enough to injure fall-sown small grains has occurred to date. This was on January 31 at which time the temperature dropped to 25° F. This froze back some of the spring wheat and oat varieties that had started to joint but did not kill any of the plants. The flax varieties, with the exception of Punjab, showed very little injury from this freeze in spite of the fact that they had been making rapid growth just before the freeze occurred.

Many commercial plantings of flax were made in south Texas last fall. All reports received indicate that good stands were obtained, and that the crop has been making very satisfactory progress. Many of these fields are in full bloom at present, which is attracting much attention. A few reports of some disease in the flax (probably pasmo) have been received recently.

Leaf rust of wheat was first observed during the last week in December, and is now quite uniformly distributed throughout the nursery. Some varieties show a 100 percent infection on the older leaves. Four infection centers of stem rust of wheat and numerous infection centers of crown rust of oats were found in the nursery yesterday.

SUBSTATION NO. 6, DENTON (Wheat Improvement, I. M. Atkins) (Feb. 15)

The weather during the first half of February continued warm and unfavorable for the best condition of crops and fruit. Maximum temperatures for the day have been in the 70's most of the time. Skies have been mostly clear and no precipitation of importance was recorded.

Such weather has caused very rapid growth of all small grains. Fruit trees are in full bloom and some trees have started to leaf out. Both fruit and small grains are in very poor condition to withstand any freeze and unless very unusual weather occurs, damage to both crops may be expected.

Seed was prepared, and all spring sown oats, except smut nurseries, were sown last week. It was hoped that emergence would not occur promptly but full emergence was recorded today, owing to the warm weather.

The short cold period, with a low of 16° F. on January 31, caused differential killing in the fall-sown oat nursery. Counts of survival in the winter hardiness nursery were made today.

The writer presented a paper at the meeting of the West Texas Certified Seed Growers at Lubbock, Texas, February 11 and 12. On this trip the experimental nursery at Amarillo was inspected, and cooperative tests at Amarillo, Bushland, Plainview, and Floydada were visited. The experimental nursery at Amarillo is in good condition, but wheat on farms in the vicinity of Amarillo has made little growth and much of it has not germinated. The cooperative tests at Bushland, Plainview, and Floydada are in fair condition but need additional moisture.

(Mar. 1)

Meteorological data recorded for February were as follows: Maximum temperature 78°, minimum temperature 24°, mean temperature 53°; precipitation, 4.44 inches, or 2.58 inches above normal. A 3-inch snow was received on February 21. The mean temperature for the month was 4.3° above normal and the accumulated departure from normal since January 1 is 7.6°. This shows how unusually mild the winter has been. Heavy rains from February 14 to 18 caused widespread damage by erosion and floods to this part of the State. In many sections of north Texas from 7 to 10 inches of precipitation were reported. This rain was followed by a "norther" which caused some injury to fruit. Some heaving was caused by this freeze in the spring oat nursery, which had just emerged.

Growth of small grains continues very rapid. Top leaves were injured slightly by the freeze of last week but plants are rapidly recovering. Small grains are 6 to 8 inches high and as far advanced for this time of year as the writer has ever seen them. The first leaf rust of wheat was found today.

At least part of the Panhandle area of Texas received much needed moisture during the recent rains. Amarillo reported more than 2 inches of rainfall in February, including a 7-inch snow. From newspaper reports, this condition was general from Amarillo south and west to the State line. This should insure continued growth of wheat for some time and reduce the possibility of wind erosion.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (Feb. 16)

Cold waves repeatedly forecast for Oklahoma have been diverted to other areas. As a result unusually warm weather during the past few weeks has caused an abnormal amount of winter growth of wheat that may prove serious if rain is not received. A January-15 seeding of wheat, barley, and oats emerged prior to February 1, whereas it normally does not emerge until March. Early strains of apricots, lilacs, Colutea, Chinese elms, China fleece vines and other vines, shrubs, and trees are showing small leaves and flower buds.

The winter thus far has been dry, and burned spots in early seeded farm fields are evident though in general wheat over most of the State is in good condition but needs rain. On the station September-15 dates of seeding are showing a few burned spots.

Wheat grub worms have damaged thousands of acres of wheat in Oklahoma. Two seedings on some farms have been destroyed. They are particularly serious in the north-central part of the State though some damage has occurred in other sections. The rather dry soil in northwestern Oklahoma probably has driven the grubs deep into the soil where they are comparatively inactive. Rain and warm weather might disclose them in damaging numbers in many fields.

The spring barley and oat nurseries on the Station were seeded on February 9, as in 1937. A gentle rain on February 15 totaling 0.67 inch should insure uniform germination. A date planting of five varieties of flax will be seeded as soon as the weather permits.

NEBRASKA

AGRICULTURAL EXPERIMENT STATION, LINCOLN (Wheat Improvement, K. S. Quisenberry) (Mar. 1)

On February 15 and 16 most of Nebraska received a good blanket of snow. The amount varied from 2 or 3 inches in the western counties to as much as a foot in some eastern counties. At Lincoln, the fall was less than a foot and gave a total of 1.14 inches of precipitation, which was needed badly. The snow melted slowly and most of the moisture soaked into the soil. As a result of the moisture plus a few warm days, winter wheat is again showing signs of life. As yet no estimates can be made on winter-killing. The danger of soil blowing will be reduced, at least, for the present.

Reports from North Platte indicate that winter wheat is in fairly good shape. More moisture soon will be needed to carry the amount of growth now present. From Alliance the reports are still more encouraging, indicating that at present winter wheat is in good shape, there being considerable moisture in the soil. For the first time since 1934 there are prospects of a crop.

Plans are being made for spring seedings of oats, barley, and wheat at Lincoln, North Platte, Alliance, and Valentine. A small spring-wheat nursery is planned for Alliance in view of conditions at that station.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (Mar. 1)

The snowfall in February amounted to 1.06 inches of precipitation, which is about 3 times the average February precipitation for the past 24 years. Most of this occurred during the first half of the month. The snow was evenly distributed over the ground because the wind velocity was generally low. Occasional moderate winds caused some blocking of the roads by drifting snow. The average wind velocity for February was 4.9 m.p.h., which is the lowest February wind velocity on record at this station.

Temperatures were unseasonably low for most of the month. The mean temperature was 8°, or 5° below average. The maximum temperature was 44° on the 27th and the minimum -20° on the 16th and 17th. Temperatures remained continuously below freezing except for one day, Feb. 7, when a maximum of 36° was recorded, until Feb. 24 when a maximum of 34° was recorded. On Feb. 25 and 26 the mean temperature was above freezing and considerable thawing occurred. Apparently most of the water went into the ground as the run-off was moderate, considering the quantity of snow that disappeared.

A little water is running over the ice in the Heart River but very little ice has yet come to the surface. Rise of the river and breakup of ice may be expected within the next few days, especially if the present mild weather continues.

OREGON

PENDLETON FIELD STATION, PENDLETON (Cereal Agronomy, J. F. Martin) (Mar. 1)

Temperatures during the past winter were unusually mild, and even the least hardy varieties came through with excellent stands. The lowest temperature recorded during the winter was +14° on January 31. The precipitation for January was about average, but that for February was twice the normal of 1.15 inches.

Warm weather prevails now, and if additional rain does not fall the soil will be in condition for seeding within a few days.

UTAH

AGRICULTURAL EXPERIMENT STATION, LOGAN (Cereal Agronomy, R. W. Woodward) (Mar. 1)

The winter has been exceptionally mild. There has been a nearly normal rainfall since November 1. Only a slight amount of snow has fallen, all of which melted within a few days after falling. Winter wheat has therefore been exposed most of the winter to the autumn-like temperatures. A low for the winter of +8° was recorded on February 18, while most minimum temperatures since December 1 have ranged from 18° to 38°. A heavy rain today is the first major storm recorded since February 4. Fear is expressed of a water shortage due to the deficiency of snow at high elevations and the receding snow line already far up the mountain slopes.

Several farmers have already seeded small grains in counties south of Cache. A few days of clear weather would enable us to commence nursery seeding at Logan.

CALIFORNIA

BIGGS RICE FIELD STATION, BIGGS (Rice Agronomy, L. L. Davis) (Mar. 2)

The rainfall in February was the heaviest since 1915. The total precipitation in February this year was 7.58 inches. Rain was recorded on 17 days. The normal rainfall for this month is 3.72 inches. March has a good start with 0.85 inch the first day. There is an unusual heavy snow pack in the mountains and no shortage of irrigation water is anticipated. There is a hazard from floods should snow melt too rapidly.

On February 24, the writer spent the day at Davis conferring with experiment station officials and attending a faculty luncheon given in honor of the Secretary of Agriculture.

UNIVERSITY FARM, DAVIS (Cereal Agronomy, C. A. Suneson) (Feb. 15)

The rainfall since July 1 now totals 19.5 inches, which is 9 inches over the normal for the period. An 18-day continuous rain storm yielding 10.2 inches of rain has just been experienced. Flood damage has not been so great as during the early December storm, however. Only two light frosts have been recorded this winter.

An unusually heavy growth of annual weeds has started. A few seedings, pending since December, remain to be completed as soon as the soil dries. Several early sown barley and wheat varieties have headed already. Barley scald (Rhynchosporium) is damaging susceptible varieties considerably.

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C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 April 10, 1938 No. 4

Personnel (Mar. 11-Apr. 10) and Field Station (March 1-31)

PERSONNEL ITEMS

Dr. S. C. Salmon and Mr. C. C. Fifield were in Manhattan, Kans., on March 24 and 25 to meet representatives from Oklahoma, Texas, Colorado, Nebraska, and Minnesota for a discussion of the program of work to be undertaken at the new milling and baking laboratory at the Kansas Agricultural Experiment Station and to consider the hard winter wheat improvement program in general. The first day was devoted to the program to be undertaken at the milling and baking laboratory recently established at Manhattan in cooperation with the agricultural experiment stations of the Great Plains. Representatives from the agricultural experiment stations of Oklahoma, Texas, Colorado, Nebraska, and Minnesota were present. The following members of the Division of Cereal Crops and Diseases attended the conference: V. C. Hubbard, I. M. Atkins, J. J. Curtis, K. S. Quisenberry, and E. R. Ausemus.

Mr. Fifield also conferred with cereal chemists in commercial milling and baking laboratories in Chicago, Ill., and Kansas City, Kans.

Dr. E. C. Tullis was in Washington from March 21 to 25 to confer with officials of the Division regarding rice research and to obtain photomicrographic illustrations for a manuscript on rice smut.

RECENT PUBLICATIONS

Relation of Certain Plant Characters to Strength of Straw and Lodging in Winter Wheat. I. M. Atkins. Jour. Agr. Research 56(2): 99-120. January 15, 1938. (G-1074) (A report of cooperative investigations at Texas Substation No. 6, Denton, Tex., conducted by the Division of Cereal Crops and Diseases, and the Texas Agricultural Experiment Station.)

Inheritance of Resistance to Loose and Covered Smuts in Markton Oat Hybrids. George M. Reed and T. R. Stanton. Jour. Agr. Research 56(3): 159-175, figs. 1-3. February 1, 1938. (G-1079) (The investigations herein reported were conducted cooperatively by the Division of Cereal Crops and Diseases and the Brooklyn Botanic Garden, Brooklyn, N. Y.)

Chromosomes of Maize from North American Indians. A. E. Longley. Jour. Agr. Research 56(3): 177-195, figs. 1-13. February 1, 1938. (G-1082).

The Relation of the National Agricultural Program to Agronomic Betterment. M. A. McCall. Jour. Amer. Soc. Agron. 30(3): 171-178. March 1938.

Integrating Research and Extension in Agronomy. R. D. Lewis. Jour. Amer. Soc. Agron. 30(3): 179-188. March 1938. (Contribution from the Department of Agronomy, Ohio State University, and the Bureau of Plant Industry, U. S. Dept. of Agriculture.)

Row Spacing and Rate of Seeding for Rice Nursery Plats. N. E. Jodon and H. M. Beachell. Jour. Amer. Soc. Agron. 30(3): 212-219. March 1938. (Contribution from the Division of Cereal Crops and Diseases in cooperation with the Louisiana and Texas Agricultural Experiment Stations.)

Barley and Malt Studies. IV. Experimental Malting of Barleys Grown in 1936 and Summary Data for Three Years, 1934-36. James G. Dickson, Allan D. Dickson, H. L. Shands, and B. A. Burkhart. Cereal Chem. 15(2): 133-168. March 1938. (Based on cooperative investigations between the Division of Cereal Crops and Diseases and the Wisconsin Agricultural Experiment Station. The cooperative investigations include the agricultural experiment stations of California, Colorado, Illinois, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin, where the uniform barley varietal series are grown each year.)

Interrelation of Take-All Lesions on the Crowns, Culms, and Roots of Wheat Plants. Hurley Fellows. Phytopathology 28(3): 191-195. March 1938. (Cooperative investigations by the Division of Cereal Crops and Diseases and the Department of Botany, Kansas Agricultural Experiment Station.)

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C.

Division of Operation

March 16, 1938.

Division of Operation Memorandum No. 37.

Attention is called to Paragraph 1834 of the Regulations governing the marking of vehicles which provides: "Trucks shall be marked on both sides, in suitable colors, as follows: By a union shield with the same lettering as applied to passenger cars, except that the shield shall be not less than ten x ten inches in size."

It is apparent that this section of the Regulations is not being generally observed, as trucks marked with small letters in a five x five shield have been seen parked in the vicinity of the South Building.

Bureaus are requested to have their motor trucks, whether operated in the District of Columbia or elsewhere, marked in accordance with the regulations.

/s/ Joseph Haley
Joseph Haley,
Chief, Division of Operation.

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C.

March 23, 1938.

MEMORANDUM NO. 751

To avoid the necessity for the frequent revision of the Department Regulations and also the undesirable increase in their physical volume, detailed procedures which are subject to Department control have been generally omitted and instead the following statement was included in the order promulgating the Regulations.

"These Regulations are supplemented by the following:

1. Secretary's Memoranda
2. Budget and Finance Circulars
3. Personnel Circulars
4. Division of Operation Circulars
5. Informational Memoranda to Chiefs of Bureaus and Offices."

To increase the effectiveness of the above described documents as supplements to the Regulations, all future issues of such documents which relate to the subject matter of specific Regulations will include the following statement as the final paragraph:

"This document supplements the instructions contained in Department Regulation No. _____. Employees maintaining copies of the Regulations should record this circular by an appropriate cross reference notation in their Regulations."

It is recognized that the original distribution of the supplemental media does not coincide with the distribution of the Department Regulations, but it is believed that coverage is provided, where necessary, by the reproduction of these documents as part of bureau house organs, administrative circulars, etc. To accomplish the desired cross reference of the Regulations it is important that the foregoing paragraph, wherever it appears in a circular or memorandum, be included in any bureau reproduction of the original document.

/s/ H. A. Wallace
Secretary.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
WASHINGTON

Office of Chief of Bureau
B. P. I. Memo. 986

April 9, 1938.

MEMORANDUM TO HEADS OF DIVISIONS.

Gentlemen:

We are experiencing extensive delays in the submittal of many sick leave slips. Your attention is called to Section 14 of Executive Order No. 7846, dated March 21, 1938, prescribing regulations relating to sick leave of Government employees, which reads as follows:

"SEC. 14. Notification of absence on account of sickness shall be given as soon as possible on the first day of absence. If such notification is not made in accordance with this regulation, such absence may be charged to annual leave or leave without pay. Application for sick leave shall be filed within two days after return to duty."

Please note that "Application for sick leave shall be filed within two days after return to duty." In a number of cases it has become necessary to delay submitting the salary voucher because of delay in receiving the sick leave application. This is frequently inconvenient to the individual affected. Prompt notice should be given the Bureau time clerk when a person is absent because of illness. Please cooperate in expediting the submittal of leave slips covering employees of your Division.

Your attention is also called to memoranda to heads of divisions dated May 26, 1936, and March 15, 1937, bearing on advance sick leave. In all cases, applications for advance sick leave should be submitted as soon as it is known that additional sick leave beyond that available to an employee will be required. This application should be supported by a statement of the attending physician giving a brief history of the case and containing a recommendation that the additional sick leave is necessary.

It will be appreciated if you will assist us in meeting these requirements.

Very sincerely,

/s/ H. E. Allanson
Business Manager of Bureau.

MEMORANDUM TO THE FIELD STAFF

Re: Official Hours on Saturdays.

Some time ago a survey was made of the official hours of the institutions throughout the country at which we have cooperative employees, in order to have a record of the official hours of each of our field employees, since it is expected that they follow rather closely the official hours of the cooperating institution at which they are stationed, except that on Saturdays four hours shall constitute a day's work for full-time employees.

It was noted in several instances that Saturday's official day at the cooperating institution consists of only 3-1/2 hours. Under the regulations of the Department, it is specifically stated that four hours shall constitute a day's work on Saturdays, so at least four hours must be devoted to official work. Even though the official hours of the cooperating institution vary from this, it is still necessary for the Division employees to put in at least the four hours of service on Saturday.

W. A. McCall

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

LOUISIANA

RICE EXPERIMENT STATION, CROWLEY (Rice Agronomy, J. M. Jenkins) (Apr. 7)

Extreme temperatures were about the same in February 1938 and 1937. In both years the minimum was 28°, and ice formed on two days. The average mean of 50° was, however, 4° less in 1938 than in 1937.

The total precipitation of 2.65 inches occurred on 11 days and was 0.97 inch more than in February 1937 and 1.46 inches more than the 28-year average for February.

Temperatures in March were unusually high, and the total precipitation was much below that of last year. The maximum temperature was 84° and the minimum 42°, with an average minimum of 58° and an average mean of 68°. In March 1937, the maximum was 79°, the minimum 28°, and the average mean 56°.

The total precipitation of 1.04 inches occurred on nine days and was 2.46 inches less than in March 1937 and 2.87 inches less than the 28-year average for March. The precipitation for March was the lowest in the past 28 years, except for 1916 when only 0.34 inch was recorded.

Because of the excellent weather in February and March farm work is much farther advanced than usual at this season of the year. Much of the rice acreage was seeded in the early part of March and was large enough to be flooded by the end of the month.

If bad weather had prevailed in February and March many cattle would have died as a result of their weakened condition due to the early cold weather of last fall.

A rice conference was held at this Station on February 7 and 8. The personnel of this meeting included most of those active in the various lines of investigational work with rice in the United States Department of Agriculture, and the states of Arkansas, Texas, and Louisiana. Topics of discussion included rice breeding, rotation and cultural experiments, fertilizer experiments, nutritional studies, diseases, insects, milling and cooking qualities of rice varieties, and marketing. There were about 20 present.

MINNESOTA

AGRICULTURAL EXPERIMENT STATION, UNIVERSITY FARM, ST. PAUL (Wheat Breeding, E. R. Ausemus) (Apr. 4)

The winter months have been rather mild. While the mean temperatures are approximately normal, according to the weather data, temperatures have not dropped as low or for as long periods as usual in this area. The minimum temperature recorded was -14° on January 27. The precipitation during the 7-month period Sept. 1, 1937, to March 31, 1938, was 7.67 inches, a deficiency of 3.02 inches. Only two months, January and March, had a heavier rainfall than the normal.

March was unusually mild and considerable spring wheat was sown. Reports were received of farmers seeding wheat in the Red River Valley during the third week in March. This is about three weeks earlier than normal. The weather was favorable for seeding until April 1; since then the ground has been wet and frozen.

The fields of winter wheat and rye have started spring growth and do not appear to have been injured during the winter.

Seed of the spring grains is being prepared for seeding in the nurseries and field plots.

TEXAS

SUBSTATION NO. 6, DENTON (Wheat Improvement, I. M. Atkins) (March 18)

The unseasonably warm weather which has prevailed for the last two months continues. A maximum temperature of 85° has been recorded on several days. The minimum temperature so far this month is 30°; there have been only two frosts. The weather has been clear for the most part and favorable for growth of crops.

All small grains have made unprecedented progress for this time of the year. Rye is booting and the earliest wheats and some barley varieties are also in boot two to three weeks early. The average date of last killing frost is still about ten days off so there is considerable danger of damage to small grain crops.

Leaf rust of wheat was found on March 1 and has increased rather rapidly since then. Dr. H. A. Edson, Principal Pathologist, Division of Mycology and Disease Survey, was a visitor today. He had just driven from New Mexico to Denton and reported leaf rust abundant throughout the west Texas wheat area through which he passed.

(Apr. 1)

Weather conditions in March were very abnormal. The abnormally high temperatures which started in January continued throughout March. The mean temperature for the month was 62.9°, which is an all time high record for March. A maximum of 86° was recorded, while the lowest was 30°. These temperatures bring the accumulated departure from normal since January 1 to +14.8. The excessive rainfall of February was followed by clear, open weather during the first three weeks of March. During a period of approximately 48 hours (March 26 to 28) 7.79 inches of rain was recorded at the Station and more than 10 inches fell in the city of Denton. The total for the month was 8.58 inches, or 6.24 inches above normal, and more than twice the previous high record for March. It also brings the accumulated departure from normal since January 1 to 9.74 inches. No killing frost occurred in March.

These weather conditions have caused abnormal development of small grains. At this time rye is headed, Fultz and other early wheat varieties are heading, barley varieties are heading, and oats are approaching the heading stage. This is from two to three weeks earlier than normal. Owing to the abundant moisture, heavy dews, and abundant precipitation small grains are very rank. Leaf rust of wheat has reached epidemic proportions and is damaging the more susceptible varieties. Mildew and leaf blotches also are prevalent.

There was a general precipitation over the State last week, and the condition of the wheat crop in the hard wheat belt is, in general, good.

(April 4)

Crown rust of oats was found on the experimental oats at the Station, today. Only a small amount of infection could be found but it is of special significance as this date of discovery is about a month earlier than usually expected.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (Apr. 1)

Winter wheat is unusually far advanced at this date. It has grown almost continuously since the middle of February without a set back. Varieties with a tendency to weak straw are in a condition to lodge if normal or above normal precipitation falls between now and harvest. Kanred, Turkey, and Quivira strains are already sprawling so that it is difficult to walk between nursery rows.

An opportune rain of 1.15 inches on March 26 and 27 has postponed for a time early drought injury to early seedings and of a number of the more advanced strains.

Conditions for spring seeding were very favorable. The spring barley, oats, wheat, flax, and Perilla seedings are up to good stands. Spring barley and oats are beginning to stool at this writing.

March as a whole has been mild. Freezing temperatures occurred but four times during the month. The maximum, minimum, and mean temperatures were 86° on the 21st; 22° on the 5th; and 53°, respectively. The total precipitation was 1.86 inches, which is practically normal for the Station. A heavy snow is falling at this writing.

KANSAS

AGRICULTURAL EXPERIMENT STATION, MANHATTAN (Wheat Leaf Rust, C. O. Johnston) (Mar. 28)

This has been one of the earliest spring seasons ever recorded for Kansas. In general, the winter was mild but very dry. No large quantity of moisture was obtained at one time during the period from November 1 to March, inclusive. A soaking rain of 1.71 inches fell at Manhattan on March 8 and 9, temporarily breaking the drought and giving impetus to spring growth. This moisture fell over the whole of Kansas as a slow drizzling rain which soaked into the soil almost as fast as it fell. All parts of the State with the exception of the extreme southwestern corner received nearly an inch of moisture at that time.

The temperatures during March have been considerably higher than usual and the season is fully two weeks ahead of average. Much apprehension is being expressed by grain men about the safety of the winter wheat crop in nearly all parts of the State. Spring growth has been exceedingly rapid and much wheat in the eastern half of the State is now nearing the jointing stage. In the south central part of the State the crop is still further advanced. A severe freeze now would do great damage and it is still too early in the season to expect that such freezes will not occur. May 10 is the frost-free date at Manhattan.

The spring wheat section of the rust nursery was sown on March 12 and emerged on March 21. Excellent stands were obtained. No rust of any kind has appeared in the nursery as yet, although wheat is now 6 to 8 inches tall. An overhead irrigation system was installed in the nursery on March 23 and first artificial inoculations with leaf rust were made on March 24. Stem rust inoculations will not be started for about 6 weeks. The winter wheat rust nursery has been trimmed and labeled. The nursery is remarkably free from all leaf diseases. Even speckled leaf blotch (Septoria) and mildew are absent. This is due to the extremely short fall and winter growth.

It is raining at Manhattan today and western Kansas received rain yesterday. Moisture has penetrated to a depth of about 30 inches here but the soil is dry below that depth.

NEBRASKA

AGRICULTURAL EXPERIMENT STATION, LINCOLN (Wheat Improvement, K. S. Quisenberry) (Mar. 31)

Growing conditions during March have been nearly ideal for winter wheat. While moisture has not been abundant, there has been sufficient to keep the plants in good condition. The total precipitation for March was 1.69 inches compared to an average of 1.27. Temperatures have been mild so that wheat has made a remarkable recovery. Fields throughout this part of the State now are showing a good green color. In the varietal plots there has been some killing among the more tender varieties, in some cases as much as 40 to 50 percent. In the case of the adapted varieties very little if any killing can be found.

In the winter wheat nursery there has been considerable killing in some instances. Tender varieties such as Redhart and Purplestraw in the eastern winter-hardiness nursery are practically gone. Other varieties of soft wheat are injured in varying degrees. Many of the lines of Hope x Cheyenne and Hope x Turkey (C. I. 10016) have been injured and most of the Hope x Mediterranean material is completely killed. No killing was observed among the well-adapted lines. All seedings of winter barley were killed with the exception of an occasional surviving plant. Many of the hybrid rows of wheat that were space-planted show poor survival due partly to the lack of growth last fall. It is felt that injury this year was caused by a combination of drought and low temperature. Owing to the late date of seeding, the plants were not well established when winter set in.

All varietal plots of spring wheat, oats, and barley were seeded from March 22 to 25. The oat and barley nursery material was seeded during the week of March 20. Spring seedings of the wheat classification nursery, put in the ground on March 18, had emerged by March 28.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (Mar. 16)

Weather conditions during the first half of March were about normal for this time of year. The snowfall amounted to 0.29 inch of precipitation. The maximum temperature was 57° on the 15th and the minimum 2° on the 7th. Alternate above and below freezing temperatures caused gradual thawing with little run-off during the first 10 days. On the 11th and 12 more rapid thawing occurred with considerable run-off. In the afternoon of the 14th the heavy ice started moving down in the Heart River and gorged in the channel adjacent to Mandan. Between 3 p. m. and midnight the water rose about 10 feet and covered the floors of houses in a low-lying section of Mandan. The water has remained at about 12 feet above the winter level for the past 36 hours. Very little ice has yet moved from the Heart River channel into the Missouri River. The latter also has started to rise near Mandan. Most of the ice is floating but is not yet moving out. There

is always danger of flooding at Mandan until the ice has moved out of both streams. Dikes constructed in recent years have prevented serious flood damage near Mandan and may be expected to prevent more serious damage this year unless the water should reach an unprecedented level.

(Apr. 1)

The weather during the latter half of March until the 28th was mild; the temperatures were almost continuously above freezing and wind was low.

The Heart River, which overflowed its banks March 14, rose to about 14 feet above the winter level the night of March 16. The lower floors of about 30 houses in the south and southeast sections of Mandan were flooded. The Missouri River, which had been rising gradually since March 12, rose rapidly about 10 feet March 19 and overflowed the lowlands southeast of Mandan. The rapid rise was caused by the breaking of an ice gorge north of Mandan. The water flowed freely because an ice gorge which began to form in the stream south of Mandan was blasted out just before the high water arrived. Probably the benefit to hay and crop lands exceeded the damage. By early morning of the 20th the river was back within its banks. The water in both streams has since dropped to a low level for this season.

After the snow melted the experiment station plot lands were cleared of weeds and some plowing was done. Some wheat was sown on farms near Mandan.

On March 28 a slow, drizzling rain of about a third of an inch wet the ground surface thoroughly. On the 29th, the temperature dropped rapidly and has since remained below freezing. The frozen condition of the ground surface prevented serious soil blowing from high winds during the past few days. Practically no more field work can be done until the ground thaws again. The maximum temperature was 65° on the 27th and the minimum, 17° on the 31st; the precipitation was 0.35 inch.

UTAH

AGRICULTURAL EXPERIMENT STATION, LOGAN (Cereal Agronomy, R. W. Woodward) (Apr. 2)

March has been Utah's most wintry month this year. It came in like a lion and went out somewhat worse. On March 22, the minimum temperature was -4°, 11° lower than any time during the winter. The precipitation at Logan totaled 4.01 which is one of the highest monthly totals on record. Other points in the State show even higher precipitation, close to all time records.

Moisture prospects at this time are unusually good.

Very little seeding has been done except in a few southern counties of the State. All nursery material at Logan is in readiness but none has been seeded yet except a few rows for smut studies.

There were only two clear days in March.

CALIFORNIA

UNIVERSITY FARM, DAVIS (Cereal Agronomy, C. A. Suneson) (Mar. 16)

The excess precipitation continues. This is the wettest season since 1914; a total of 23.52 inches was recorded prior to today's rain. The normal rainfall is 13.4 inches. Since December 8 the soil has never dried sufficiently for successful drilling. There has been very little damage to grain from standing water, however, and moisture penetration into the silt-clay loam soil exceeds 12 feet. Weeds are abundant everywhere. The minimum temperature this winter (29°) was not low enough to kill even such tender leaves as those of castor beans.

It is estimated that only 60 or 70 percent of the normal acreage of small grains in this section has been sown. It is doubtful if a satisfactory commercial crop can be expected from any subsequent seeding. Another important crop, sugar beets, normally planted here from December until mid-April and harvested from August to December is threatened with even greater curtailment. As a result a large acreage of milo and beans probably will be planted.

October seedings of most cereal varieties have headed. Heading will begin in the breeding nurseries in about a week. Barley scald is abundant, some early sown barley varieties having lost their leaves a month ago. Septoria has damaged some wheat varieties nearly as much. Stem rust has not been observed in any of the experimental seedings but is abundant on scattered volunteer plants. There is no lodging yet.

Secretary H. A. Wallace addressed students and faculty here on February 24.

ARIZONA

AGRICULTURAL EXPERIMENT STATION, TUCSON (Cereal Agronomy, A. T. Bartel) (Apr. 5)

The small grain nursery is looking very well for this time of the year. Most of the barley varieties and a few of the earliest varieties of oats and wheat have headed. All varieties of flax have flowered; the plants are much shorter than normal.

The mean maximum temperature for March was 72° and the mean minimum, 43.1°. The maximum temperature was 85°. There was only one day in which freezing temperatures were recorded and this was on March 31, when the temperature went down to 31°. The precipitation was 0.43 inch.

MAY 11 1938
BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 April 25, 1938 No. 5

Personnel (Apr. 11 - 25) and Field Station (Apr. 1 - 15)

PERSONNEL ITEMS

Mr. Bruce Caldwell spent April 18 and 19 at the U. S. Regional Vegetable Breeding Laboratory, Charleston, S. C., to plant corn and teosinte in experimental plots.

Mr. Robert C. Eckhardt, of the Iowa Agricultural Experiment Station, who last year assisted in the cooperative Iowa Corn Yield Test at Ames, was transferred on April 1 to the corn breeding project as assistant to Dr. A. A. Bryan. He has succeeded Mr. R. W. Jugenheimer in this work. Mr. M. S. Zuber, agent, will assist in the Corn Yield Test.

Dr. M. T. Jenkins spent four days beginning April 20 at Urbana, Ill., and La Fayette, Ind., to discuss plans for the season's work with officials of the Illinois station and discuss arrangements at the Indiana station incident to the transfer of Dr. A. M. Brunson from Manhattan, Kans., who took charge on April 1 of the various phases of the cooperative investigations.

Dr. Jenkins reports that winter plantings of corn at Canal Point, Florida, started three years ago, were unusually successful this season. They covered about 1 1/2 acres on the United States Sugar Plant Field Station, through whose courtesy and cooperation space was made available. Mr. H. S. Garrison made most of the pollinations and obtained a large number of well-filled ears.

Dr. L. F. Randolph visited the Station in January and made sporocyte examinations of his cultures. Material was included for Dr. R. A. Emerson, who made several trips from eastern Florida to hand-pollinate the strains in which he was particularly interested. On the whole, it was the most successful of the three winter plantings that have been grown at Canal Point. Only material in which selection was unnecessary was included, so that the crop obtained represents the saving of a year's time in the breeding program.

Mr. R. W. Jugenheimer, formerly assistant to Dr. A. A. Bryan on the corn breeding project at Ames, Iowa, was transferred on March 21 to Manhattan, Kans., to take charge of the cooperative corn investigations formerly carried on by Dr. Arthur M. Brunson at the Kansas Agricultural Experiment Station.

Mr. H. H. McKinney spent several days early in April in Illinois and Indiana to take field notes on experimental plots of mosaic disease of wheat and to confer with workers at the State agricultural experiment stations. Mosaic was found growing on wheat in three counties in Illinois--Macoupin, Coles, and Shelby--where it had not been found before. Satisfactory data on mosaic were obtained in nurseries in Tazewell, Mason, and Clark Counties, Illinois, and in the cooperative nursery at La Fayette, Ind.

Dr. S. C. Salmon spent three days last week at Ames and Cherokee, Iowa, making plans for the cooperative weed research program for the coming year. He stopped at Columbus, Ohio, on the return trip for a conference with Dr. C. J. Willard and Dr. R. D. Lewis of the Ohio College of Agriculture on weed research problems in Ohio.

Mr. John F. Trost, formerly associate pathologist of this Division, stationed at the Purdue University Agricultural Experiment Station, has resigned effective April 30 and will be associated with an Indiana company engaged in the production of hybrid seed corn.

RECENT PUBLICATIONS

Effect of Spacing on the Development of the Flax Plant. A. C. Dillman and J. C. Brinsmade, Jr. Jour. Amer. Soc. Agron. 30(4): 267-278, figs. 1-2, April 1938.

Natural Crossing in Flax. A. C. Dillman. Jour. Amer. Soc. Agron. 30(4): 279-286, figs. 1-4. April 1938. (The experiments at St. Paul, Minn., and Bozeman, Mont., were conducted in cooperation with the State agricultural experiment stations.)

Experiments on Artificial Hybridization of Rice. N. E. Jodon. Jour. Amer. Soc. Agron. 30(4): 294-305, figs. 1-2. April 1938. (Contribution from the Division of Cereal Crops and Diseases in cooperation with the Louisiana Agricultural Experiment Station. Experiments conducted at the Rice Experiment Station, Crowley, La.)

Registration of Improved Sorghum Varieties. John H. Parker. Jour. Amer. Soc. Agron. 30(4): 306-308. April 1938.

A Simplified Method for Testing the Lodging Resistance of Varieties and Strains of Wheat. I. M. Atkins. Jour. Amer. Soc. Agron. 30(4): 309-313, figs. 1-3. April 1938. (The studies herein reported were conducted cooperatively by the Division of Cereal Crops and Diseases and the Texas Agricultural Experiment Station.)

Differential Feeding of Grasshoppers on Corn and Sorghums. Arthur M. Brunson and Reginald H. Painter. Jour. Amer. Soc. Agron. 30(4): 334-346, figs. 1-4. April 1938. (Joint contribution from the Division of Cereal Crops and Diseases and the Kansas Agricultural Experiment Station.)

A Dwarf Oat Found in a Nortex-Victoria Cross. (Note) Jour. Amer. Soc. Agron. 30(4): 347-348, figs. 1-2. April 1938. (Cooperation between the Division of Cereal Crops and Diseases and the Texas Agricultural Experiment Station at Texas Substation No. 6, Denton, Tex.)

Gummed-Paper Tape for Space-Planting Wheat. (Note) Jour. Amer. Soc. Agron. 30(4): 348-352, figs. 1-2. April 1938.

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

MINNESOTA

AGRICULTURAL EXPERIMENT STATION, UNIVERSITY FARM, ST. PAUL (Wheat Breeding, E. R. Ausemus) (Apr. 16)

Seeding of spring grains, delayed during the first half of April because of cold weather, was resumed on April 11; the ground was very dry. Rain began on April 14 and approximately 2 inches have fallen so far.

Winter wheat is in good condition.

The wheat rod-row nurseries were sown at University Farm and Waseca on April 13.

TEXAS

SUBSTATION NO. 6, DENTON (Wheat Improvement, I. M. Atkins) (Apr. 15)

The effects of the severe blizzard that occurred in the Middle Western States from April 6 to 10 were not so injurious in north-central Texas as in the western part of the State. Following several days of very warm weather with a maximum of 82°, there were two days of extremely high winds followed by low temperatures and a killing frost with a minimum temperature of 30°. The wind velocity during the first day of the storm averaged 22.5 miles per hour and 14 miles per hour the second day. These are record wind velocities for April and approach the all-time record of 25 miles per hour for a 24-hour period in March 1923.

Damage in this immediate area was confined mostly to gardens and truck crops. Corn was injured but not killed. Fruit was injured to some extent but most of the damage was due to the strong winds rather than low temperatures. Small grains show little damage except for the shredding of leaves by the high winds. Many early varieties were in head and pollen may have been killed so that no seed will set.

The damage to the wheat crop of western Texas, which was one of the most promising on record prior to the storm, was estimated from slight damage to as high as 85 percent. According to newspaper reports, the latest estimates indicate that probably the only damage occurred in the southern part of the Panhandle, where wheat was rank and early. The damage in that area probably is less than 25 percent.

The amount of damage to small grain in the middle western part of the State below the "caprock" has not been reported to the writer. From newspaper reports it would seem that most of the damage may be expected in fields of Early Blackhull wheat, which were heading or approaching the heading stage. Whether or not fields sown to Early Blackhull will partly recover is not known.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (Apr. 16)

The severest blizzard ever to strike Oklahoma in April fortunately did very little damage to winter or spring grains in this area. Early Blackhull, Early Kanred, and Nebraska 28, being farthest advanced, showed the most injury. The upper leaves were frosted but heads in the boot show no sign of injury. It is possible that damage in the form of blasted heads or sterile florets may show up later.

Because of the high winds and unusual drifting no accurate measurement of the amount of snow was obtained. Estimates varied from 8 to 14 inches. The snow undoubtedly aided in preventing severe damage to wheat. Train service was halted by 30-foot drifts in some cuts. Many highways were closed. Forty-two people were reported dead as a result of the storm.

Heading will be approximately two weeks earlier than in 1937. A few heads of Early Kanred are showing at this date. Wheat is nearly knee high. Winter barley is tillering heavily and is six to ten inches tall. Spring grains are about four inches high. The plants of five varieties of flax, nearly two inches high, were not damaged by the storm. A Perilla planting was killed 100 percent.

A total of 1.27 inches of precipitation was recorded for the first half of April. A minimum temperature of 22° on April 7 and 8 was recorded during the snow storm.

KANSAS

AGRICULTURAL EXPERIMENT STATION, MANHATTAN (Wheat Leaf Rust, C. O. Johnston) (Apr. 20)

A severe freeze occurred on April 2 and another, accompanied by strong north winds and snow, occurred on April 7 and 8. At Manhattan, the temperature went down to 20° on April 2 and to 28° on April 8. Winter wheat was not injured to any extent by either of these low temperatures, but oats and barley were rather severely frozen back. Much of the early fruit, such as apricots, peaches, pears, and plums, was in bloom and consequently was destroyed. The storm of April 7 and 8 reached blizzard proportions and snow fell to a depth of about 4 inches on the level. Although the snow was very wet the high wind caused severe drifting, leaving most fields bare in spots.

Besides the snow, which furnished 0.4 inch of moisture, a good rain of 0.5 inch fell on April 15. Several other showers have brought the total moisture so far in April to more than 1 inch. This is more than usually received at Manhattan in April.

Winter wheat in the eastern half of Kansas is in excellent condition although still too far advanced for this time of year. The April 10 estimate for Kansas was 174,500,000 bushels of wheat in 1938, about 16,500,000 bushels more than in 1937. This estimate makes no allowance for the rust epidemic now developing in Texas and Oklahoma, however. In the writer's opinion leaf and stem rusts are likely to reduce the yield considerably.

Natural infections of leaf rust were found to be widely distributed in the vicinity of Manhattan on April 13. This is fully two weeks earlier than usual. Heavy infections of leaf rust have been reported from central Oklahoma. Still heavier infections are known to be present in Texas. There is every indication, therefore, that this is to be a leaf-rust year. Stem rust is still in unknown quantity, although it is known to be developing rapidly in Texas. So far no stem rust has been seen or reported on wheat in Kansas.

Artificial inoculations with leaf rust were started in the winter-wheat rust nursery on March 25. Incubation of the first inoculations was prolonged to three weeks by cold weather. The incubation period has now been reduced to eight days and excellent infections are being obtained.

FORT HAYS EXPERIMENT STATION, HAYS (Cereal Agronomy, A. F. Swanson) (Apr. 15)

The rainfall for March and up to April 15 has been more than normal and has well supplied the current needs of winter wheat. Warm weather has prevailed during most of the period. In the Hays territory and to the south and east the growth of wheat is well advanced. There has been excessive tillering, which has tended to deplete the stored moisture supply more than is desirable.

In the northwestern portion of the State growth and tillering of wheat is less excessive than at Hays. In this territory the stored moisture is about 12 inches deep in cropped-land fields and approximately 24 inches deep on fallowed land. With normal rainfall the region should produce a fair crop of wheat. However, wheat is not uniformly good over northwestern Kansas. In localized areas soil blowing has occurred, particularly where timely rains did not fall last autumn to establish a satisfactory growth of wheat.

The oats and barley experimental work is well established for the season at this Station.

Preparations are under way to take care of the contestants who will participate in the annual grain and livestock judging contest at this station on April 29. The annual Feeders Round-Up Day will follow on April 30.

NEBRASKA

AGRICULTURAL EXPERIMENT STATION, LINCOLN (Wheat Improvement, K. S. Quisenberry) (Apr. 19)

The cold wave of early April did very little damage to crops in Nebraska. It is possible that the low temperatures checked the recovery of some of the tender winter wheat plants that had been injured during the winter. The moisture received during the storm was of great benefit. In eastern Nebraska it came in the form of rain and sleet, while in the western part of the State it came as snow, which drifted considerably. During the last week or 10 days temperatures have been mild and with timely rains winter wheat has made a remarkable growth and all fields are now a rich green color.

Spring grains in both nursery and plots have emerged to good stands and are growing rapidly.

During the first week of April a trip was made to North Platte and Alliance to take notes on the winter wheats and to seed spring grains. At North Platte there was no winter-killing of wheat, and apparently the same is true at Alliance, although final notes could not be taken there, owing to a covering of snow. For the most part, wheat in western Nebraska looks well, especially on fallow. Possibly there is too much growth for the amount of subsoil moisture available.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (Apr. 18)

Continuous cold weather with freezing temperatures every night from April 1 to 8, inclusive, delayed preparation of land for seeding. Land for the wheat nursery was duckfooted April 7 and for the increase plots April 8. The work was satisfactory except in some low, moist spots where the ground was still frozen and the duckfoot failed to go deep enough or turned over large chunks of frozen ground. These spots required further working after the ground had thawed completely. Crusting of the surface soil left the ground rougher and more lumpy than usual after duckfooting.

Seeding of the Regional and Intrastate nurseries began April 11 and was completed April 12. The wheat and oat varietal plots were sown April 13. Seeding of the remainder of the wheat nursery, including the rust nurseries and the border rows, was completed today. The flax plot and nursery land also has had a preliminary duckfooting.

The total precipitation during the first half of April was only 0.10 inch on the 15th; a trace was recorded on other days. Surface soil moisture is barely sufficient for germination of part of the seed sown but probably insufficient to insure satisfactory stands. It is hoped that the slow drizzling rain that commenced early this afternoon and still continues intermittently may provide sufficient moisture for complete emergence of seed sown. The maximum temperature was 72° on the 12th and the minimum, 14° on the 1st and 6th. Some cutworms have already been observed.

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (Apr. 16)

Moisture conditions were satisfactory when first the snow melted, but there has been but little precipitation for about a month and rain will soon be needed to germinate the seed which is rapidly going into the ground in this section.

A little seeding was done in March but colder weather delayed seeding till about a week ago when it became rather general. The rotation plots at the Substation were seeded this week, as well as field plots of spring wheat, rod rows of spring wheat, and the larger part of the bunt nursery.

In most places there is sufficient moisture to germinate the seed on cornland and on fallow, also in stubble fields where the snow was somewhat deeper in winter.

The precipitation for March was 0.40 inch, but only 0.04 inch has fallen in April so far.

WASHINGTON

AGRICULTURAL EXPERIMENT STATION, PULLMAN (Wheat Improvement, O. A. Vogel) (Apr. 12)

As a result of the relatively mild winter nearly all of the winter wheat seedings came through in good to excellent condition. Some of the early seedings in the Spokane area are being pastured because of excessive vegetative growth.

Conditions have been favorable for the seeding of spring wheat. Spring seeding in the Walla Walla and Big Bend areas has been completed for some time, while in the Palouse area the farmers have not been able to get into the fields for any very extensive work because of the wet condition of the north-hill slopes and bottom lands.

All of the spring wheat nurseries for this State have been seeded, which is at about a normal time for each of the areas represented by the various nurseries.

MAY 4 1938
BUREAU OF PLANT INDUSTRY

CEREAL COURIER

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 May 10, 1938 No. 6

Personnel (Apr. 26 - May 10) and Field Station (Apr. 16 - 30)

PERSONNEL ITEMS

Dr. B. B. Bayles left Washington April 29 to study experiments with wheat and crop conditions in general in Virginia, North Carolina, South Carolina, Georgia, Texas, and Tennessee. He will also confer with workers at the State agricultural experiment stations in these States on cooperative research.

Dr. Bayles, Dr. E. G. Bayfield, Mr. C. E. Bode, Mr. C. C. Fifield, and Mr. T. F. Hartsing have been authorized to attend the meetings of the American Association of Cereal Chemistry to be held at Cincinnati, Ohio, May 23 to 27, 1938.

Mr. F. A. Coffman returned to Washington on May 7 after a 2-week trip in the interests of oat investigations in Florida, Georgia, South Carolina, and North Carolina.

Crop conditions in the southeastern States were found for the most part favorable, although a shortage of moisture was evident in the Coastal Plain section. Very little rust was found on oats in any of these States, but in Georgia and South Carolina wheat was heavily rusted, both stem and leaf rust being present. Extensive oat breeding nurseries were inspected at Gainesville and Quincy, Fla., Tifton and Experiment, Ga., Hartsville, S. C., and Statesville, N. C. Oat breeding work in this area has been greatly increased during the past few years and many promising hybrid selections are being grown in nursery tests. Much of this breeding work is in cooperation with the Division of Cereal Crops and Diseases. An extensive flax nursery at Quitman, Ga., was observed. The excellent development of this crop in that area was somewhat of a surprise.

Mr. A. C. Dillman returned May 6 from a 10-day trip to southern Texas and southeastern Kansas. The flax experiments at Crystal City, Beeville, Angleton, and College Station, Texas, appeared very promising. There is great interest among farmers in the possibility of flax production as a fall-sown crop in southern Texas. Approximately 1,000 acres were grown this season in fields ranging from a few acres to as many as 80 acres, with estimated yields of 8 to 15 bushels an acre. The Bison variety appeared to be best adapted over most of the area, although Punjab did well under irrigation in the vicinity of Crystal City. Flax rust was present in two or three fields and pasmo and anthracnose canker (Colletotrichum) was found in the nurseries at College Station and Angleton.

In southeastern Kansas there is some increase in flax acreage over that of 1937. The crop was sown earlier than usual and appeared to be in a very satisfactory condition.

Dr. Merle T. Jenkins is attending the Conference on the Interests of Agriculture in the Industrial Utilization of Corn held at Ames, Iowa, May 9 and 10. He will present a paper on The Importance of Corn Hybrids to the Corn Industries.

Mr. L. W. Kephart will spend about 4 weeks in Ohio, Indiana, Illinois, Iowa, Minnesota, Wisconsin, Missouri, Kansas, Nebraska, South Dakota, and North Dakota, inspecting weed control experiments and conferring with officials of agricultural experiment stations in these States. He left Washington May 4.

Dr. M. A. McCall left Washington May 8 to visit certain points in Missouri, Kansas, Colorado, Nevada, California, Oregon, Washington, Idaho, Montana, North Dakota, Minnesota, Wisconsin, Illinois, and Indiana and consult with personnel of the Division and officials of cooperating State agricultural experiment stations on plans for cooperative research.

Dr. K. S. Quisenberry will leave Lincoln, Nebr., about May 17 to visit State agricultural experiment stations and Federal field stations in Texas, Oklahoma, New Mexico, Kansas, and Nebraska where he will take notes on cooperative experiments with wheat and other small grains and observe crop conditions in general.

Dr. S. C. Salmon left Washington May 4 to spend about two weeks in Kansas, Colorado, Nebraska, and Iowa in the interests of the cooperative weed research program.

Dr. L. J. Stadler was in Washington April 28 and 29. Dr. Stadler was elected a member of the National Academy of Science, Section of Botany, at the meetings April 25 to 27. He also visited State College, Pa., in the interests of cooperative corn experiments at the Pennsylvania Agricultural Experiment Station.

Mr. T. R. Stanton expects to leave Washington on May 14 to inspect cooperative and other experiments with oats, to collect plant specimens, to note the crop under field conditions, and to confer with officials of State agricultural experiment stations concerning future work. His itinerary will include stops in Virginia, Tennessee, Kentucky, Arkansas, Louisiana, Texas, Oklahoma, Kansas, and Missouri.

RECENT PUBLICATIONS

When to Cut Rice. W. D. Smith and Jenkin W. Jones. U. S. Dept. Agr. Leaflet 148, 5 pp. December 1937.

Stem Rot (Leptosphaeria salvinii Catt.) E. M. Cralley and E. C. Tullis. In Ark. Agr. Expt. Sta. Bull. 351 (49th Ann. Rept.), pp. 77-78. March 1938. (Cooperative investigations of the Arkansas Agricultural Experiment Station and the Division of Cereal Crops and Diseases.)

Chlorosis. E. C. Tullis and E. M. Cralley. In Ark. Agr. Expt. Sta. Bull. 351 (49th Ann. Rept.), pp. 78-80, illus. March 1938. (Cooperative investigations of the Division of Cereal Crops and Diseases and the Arkansas Agricultural Experiment Station.)

Data and Notes on Certified Corn Hybrids for Ohio. G. H. Stringfield. Ohio Bimo. Bull. 23(191): 29-38, fig. 1. March-April 1938. (Cooperation between the Division of Cereal Crops and Diseases and the Ohio Agricultural Experiment Station.)

ERRATA

In the articles entitled "A Dwarf Oat Found in a Nortex-Victoria Cross" and "Gummed-Paper Tape for Space-Planting Wheat," which are listed under RECENT PUBLICATIONS in the Cereal Courier vol. 30, no. 5, April 25, 1938, the authors should be I. M. Atkins and P. B. Dunkle, for the first paper, and Glenn S. Smith, for the second paper.

N O T E

There is negligence on the part of some in sending DUTY STATUS reports promptly.

H. S. Smith
Jr. Administrative Assistant.

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF DIRECTOR OF PERSONNEL
WASHINGTON, D. C.

April 5, 1938

PERSONNEL CIRCULAR NO. 61.

The Secretary Emphasizes Preventability of Accidents

During the last six months of 1937, 82 fatalities occurred on Department projects and activities. These deaths were distributed as follows: 35 appointed personnel, 29 Civilian Conservation Corps enrollees, and 18 Works Progress Administration workers. Approximately 32 percent of these fatalities were caused by vehicle accidents.

In connection with this report, the Secretary sent me the following memorandum which is self-explanatory and which deserves your careful consideration:

> "I have just gone over the report of the Division of Safety of your office which shows that for the last six months of 1937 a total of 82 persons lost their lives as a result of accidents on Department projects. This is very disturbing news.
>
> "Certainly, most if not all of these accidents were preventable. The safety program in the Department must be aggressively pushed. I hope that every bureau chief will take a personal interest in this matter and take steps which will contribute to advancing rapidly and effectively the safety program.
>
> "I note that a large number of the accidents are due to excessive speed of passenger cars and trucks. [Underscoring by M. A. McCall.] I am anxious that careful study be given to the possibility of independent action by the Department to reduce our vehicle hazards as soon as possible. Meantime, it is extremely important that there be departmental wide cooperation in the matter of prompt and accurate reports of all accidents so that the special hazards attending departmental work can be analyzed, and outstanding hazards brought to light, and action taken in the direction of reducing those hazards."

In order to carry out our safety program, it is essential that no opportunity be overlooked. I am anxious to receive any suggestions from bureau executives which will contribute to advancing the safety program. Meantime, it is essential that supervisory personnel on projects involving any degree of hazard be repeatedly encouraged to reduce hazards in the interest of improving substantially the Department's accident record in this and coming years.

W. W. Stockberger
Director of Personnel.

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

ARKANSAS

RICE BRANCH STATION, STUTTGART (Rice Production and Improvement, C. R. Adair) (Apr. 23)

Weather conditions have been rather unusual so far this year. The rainfall since January 1 has been 24.45 inches, or approximately 9.00 inches above normal. The temperatures have also been high. The average daily temperature for March was 62.4, or 10° higher than normal. These conditions have caused oats and fruits to be much earlier than usual.

Oats started heading 10 days to 2 weeks earlier than normal, and crown rust also appeared 2 weeks earlier than normal. The common oats, such as the Lee and Winter Turf varieties, are so severely infected with crown rust that yields will be almost nil. The more resistant varieties, such as strains of Red Rustproof, are only slightly infected at this time. Nearly all oats grown commercially in this section are of the Red Rustproof type, so the loss from this disease is not expected to be very great.

Another menace to the oat crop is a serious outbreak of armyworms. From April 16 to 22 it rained every day so it was impossible to use poison bait. The weather has cleared up now and it should be possible to check them with poison.

The excessive rainfall has delayed seedbed preparation and seeding of rice. Only a few very small fields have been sown at this time, whereas normally about 10 percent of the crop is sown by this date. In the date-of-seeding-rice experiment it has not been possible to sow the April 20 seeding.

Spring visitor's day was held here at the Station on April 12. Mr. J. Mitchell Jenkins, superintendent of the Rice Experiment Station at Crowley, La., was the principal speaker.

MINNESOTA

AGRICULTURAL EXPERIMENT STATION, UNIVERSITY FARM, ST. PAUL (Wheat Breeding, E. R. Ausemus) (May 2)

Wet weather during the latter half of April has delayed seeding of small grains. Spring wheat sown during the first half of the month is making excellent growth.

Winter wheat is making good growth at Waseca. There was very little winter injury either at Waseca or in the winter wheat area of Minnesota. At University Farm, however, severe winter injury occurred.

The spring wheat rust nursery was seeded on April 26 and 27. The precipitation in April was 3.95 inches, as compared with a normal of 2.12 inches. A minimum temperature of 31° was recorded on April 20 and 22, and the maximum was 78°, recorded on April 26.

TEXAS

AGRICULTURAL EXPERIMENT STATION, COLLEGE STATION (Wheat Improvement, E. S. McFadden) (May 4)

The cereal rust situation has grown continually worse in southern Texas throughout the month of April. In the cereal nurseries at Beeville, Angleton, and College Station susceptible varieties of wheat and oats that were not destroyed by the leaf rusts in March are now broken down by stem rust. Many of the Hope x Mediterranean selections that are known to have mature plant resistance carried heavy infections of stem rust on the upper leaves and sheaths at the time of heading.

Nearly all oat fields of south-central and southwestern Texas of varieties other than those of the Texas Red group were destroyed by crown rust by the middle of April. Stem rust of oats has now made its appearance in epidemic form in the same areas of the State. Varieties of the Texas Red group that had successfully resisted the crown rust epidemic are now being attacked and severely injured by stem rust. Most of the fields of Texas Red, south of a line running from Navasota to Uvalde, are so badly infested that the straw has started breaking down.

Leaf rust of wheat has been present in epidemic proportions in commercial fields of wheat throughout the State for a month or more and was resulting in considerable injury to the crop prior to the freezes of April 8 to 10. Much of the injury, now widely attributed to freezing, is probably due to a combination of leaf rust infection and whipping by the wind.

Stem rust of wheat, though present in small patches in most of the commercial fields from San Antonio to Temple, had not appeared in epidemic proportions in the main wheat-growing areas of the State up to May 1. It may, however, be present in small amounts in all wheat fields of the State with the possible exception of the Panhandle and High Plains.

High south winds for several days past have undoubtedly been carrying enormous numbers of spores of all of the cereal rusts into the grain fields farther north. Copious rains were received in the Black Lands from Temple to Dallas last night. These undoubtedly will be followed by heavy dews and thus contribute to favorable conditions for rust infections.

SUBSTATION NO. 6, DENTON (Wheat Improvement, I. M. Atkins) (May 1)

Meteorological data recorded during April were as follows: Maximum temperature 85°, minimum 30°, mean 62.3°. The precipitation was 2.74 inches. The mean temperature for the month was about 1° below normal and the precipitation about 1 inch below normal. Following the excessive precipitation of February and March, the precipitation received was more than adequate. During the last half of April heavy dews were recorded on 12 days.

As a result of these conditions, small grains have been beset by nearly everything that could attack the crop. In spite of these factors, the crop has made rapid progress and at present looks well. Nearly all grains have completed heading, while early strains of barley are starting to ripen.

Wheat on farms in this vicinity is very spotted in appearance. Some fields look well, but many are yellow from rust and lack of nitrogen as a result of excessive rains. Experimental wheat at the station is in good condition at this writing. Although leaf rust is still doing considerable damage, the crop has gained the upper hand during the heading period. Early varieties such as Missouri Early Premium, and hybrid strains from the cross (P-1066 x Prelude) x Tenmarq are approaching the ripening stage. Very late varieties are just starting to head. A few of the very early varieties were injured some by the freeze, portions of the head being sterile. The stem rust situation at this time looks rather serious. Stem rust was found on April 22 in a field near the Station, and on April 25 at the Station. This is about 8 days earlier than it has ever been found in this area. Since then, sten rust has spread and now can be found in any field in this area. Infection was found as far north as Sherman, Texas, last week and one sample from the Chillicothe (Texas) Substation was received May 1.

After the first pustules were found at Denton further search revealed several areas where the teliospore stage had been reached. These pustules were near the base of the plant and may indicate that the disease overwintered in this area. Further spread of the disease will, of course, depend upon weather conditions. At this writing (May 4) the wind has been blowing from the south for two days at velocities ranging from 10 to 20 miles per hour.

The fall-sown oat crop in this area is very promising at present. Armyworms have been present in serious numbers for two weeks. Many fields or portions of fields have been injured. If these insects can be brought under control, yields of fall oats will be high. The last few days, it appears that parasites have gained the upper hand so that damage from the worms has been reduced. Crown rust has spread rather rapidly on susceptible varieties of oats but has not yet attacked the Red Rustproof types. Some damage may occur in spring-sown oats.

The barley crop was injured more than the other small grains by the recent freeze. Many sterile heads, or portions of heads, resulted from pollen being killed during the freeze. Barley is rapidly approaching maturity and will be ready to harvest in about 10 days. The yields will be smaller than last year's record crop because of sterility as well as rather small heads.

Reports received from western Texas indicate that the crop is beginning to need additional moisture. The early rank growth has dissipated the moisture.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (May 2)

Rains totaling 4.77 inches in April exceeded the 23-year station average by 2.57 inches and has brought about unusually rank growth of cereals. Winter wheat is standing about 40 inches high. Winter barley is about 36 inches high and spring cereals are approximately 18 to 24 inches high. Kanred, Turkey, and Cheyenne winter wheat are showing 5 to 30 percent of lodging in some parts of the nursery at this date. Some interesting varietal differences are evident. So far there has been no lodging of barley or oats.

Early Kanred and Nebraska 28 were first headed on April 21 and Early Blackhull on April 26. Blackhull, Cheyenne, and Tenmarq heads are emerging at this date. Awn emergence of all but two varieties of fall-sown barley varieties has been recorded. Spring barley and oats are expected to start heading late this week or early next week.

Leaf rust of wheat was first noted at Woodward on April 22. It is now very generally distributed over the nursery and though climatic conditions have been favorable for its development infection on the Station and on farms in northwestern Oklahoma is very light and probably will not average more than 5 percent with maximum infection of 10 to 15 percent in a few fields southeast of Woodward. Dr. K. S. Chester of Stillwater reports moderate to severe infection in central and southeastern Oklahoma and estimates probable damage to wheat at 30 to 50 percent.

Maximum, minimum, and mean temperatures in April were 86° on the 30th, 22° on the 7th and 8th, and 55°, respectively.

KANSAS

AGRICULTURAL EXPERIMENT STATION, MANHATTAN (Wheat Leaf Rust, C. O. Johnston) (May 3)

Winter wheat made satisfactory progress in eastern Kansas during the last two weeks, although much of it has made too much top growth for the soil moisture available. Some damage from the freezes of April 2, 7, and 8 has been reported from the south-central part of the State where winter wheat was jointing when the low temperatures occurred. One interesting symptom of frost injury is disintegration of tissues immediately above and below the nodes, followed by blackening of the nodes and finally by breaking in that region.

Leaf rust is widely distributed over the eastern half of Kansas and is unusually abundant for the time of year. Some fields in southern Kansas already are heavily infected. Stem rust has not been reliably reported in Kansas as yet, nor has the writer been able to trap stem rust spores from the air to date.

Hypodermic inoculations with leaf rust in the rust nursery have been completed in the winter wheats and soon will be finished in the spring wheats. Excellent infections have been obtained on the winter wheats and leaf rust now is abundant throughout the nursery. Mildew also is abundant despite the fact that it has been very dry and overhead irrigation only has been used once prior to yesterday.

Early varieties of winter wheat now are in the boot and should be heading within a few days. Development of wheat in the rust nursery seems to be 10 days or more ahead of normal.

NEBRASKA

AGRICULTURAL EXPERIMENT STATION, LINCOLN (Wheat Improvement, K. S. Quisenberry) (May 4)

Growing conditions during the last of April were nearly ideal for all small grains. The total precipitation for April was 3.63 inches at the University and 3.36 inches at the Agronomy Farm. The average rainfall for April is 2.37 inches. This excess moisture has cared for plant needs very nicely and the lack of subsoil moisture has not caused trouble as yet. Growth of winter wheat is very rank and in many places is starting to lodge.

Winter wheat and rye are farther advanced than normal for this time of the year. Some rye fields on University land will be in head by May 8. Dakold and Wisconsin Pedigree No. 2 rye in the nursery will probably be heading by May 10. Early Blackhull wheat was injured by the winter and its development retarded a little so that it will not be heading for some time.

Leaf rust was observed on winter wheat May 3. The pustules were very small but could be found on most susceptible varieties at the farm and in the nursery. Conditions for rust infection have been ideal the last few days and it will be no surprise if considerable leaf rust develops.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (May 2)

Climatic conditions during the last half of April were favorable for field work and for germination of seed. Rain amounting to 0.75 inch April 24 and 25 insured germination of seed that had failed to germinate earlier. The wheat and oat varietal plots sown April 13 came up with fair but incomplete stands on April 23. Partial irregular emergence also occurred in the Regional and Intrastate wheat nurseries sown April 12. Plants are just emerging today in spots where emergence did not occur earlier, and stands appear to be good in all plot and nursery experiments.

The barley varietal plots and wheat increase plots were sown April 22 and are just emerging today.

The flax plot and nursery land were given a second duckfooting today and the flax nurseries probably will be sown this week.

The maximum temperature during the last half of April was 82° on the 30th and the minimum 23° on the 20th, the only date on which a freezing temperature occurred. The precipitation was 0.87 inch.

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (May 2)

April weather was dry until the last week. The total precipitation was 0.62 inches, most of which fell in a freak hailstorm on the 26th. Grain was just emerging and no serious damage was done. Rain totaling 0.22 inch fell during the past 24 hours.

Cereal seeding at the Substation is nearly finished except for flax, corn, and proso. Varieties of spring wheat, oats, and barley are emerging in field plots, and spring wheat in rod rows and the bunt nursery. Conditions appear to be favorable for a good infection of bunt in the smut nursery.

The winter wheat nursery was almost completely winter-killed, owing to very dry conditions in fall and spring. Winter wheat in duplicated field plots in standing corn has a thin stand, but the stands are better than in plots of winter rye which were thinned by grasshopper injury in the fall.

Army cutworms are reported to be abundant in local areas in this county and grasshoppers are expected in due time. Preparations are being made to spread considerable hopper bait in the county when the pests appear.

OREGON

PENDLETON FIELD STATION, PENDLETON (Cereal Agronomy, J. F. Martin) (Apr. 30)

All spring sowings, with the exception of flax, have emerged with good stands. The stand of flax is rather uneven owing to the inability of the crop to emerge through a crust which formed following a rain. Spring grains appear somewhat backward, but fall-sown crops have made a luxuriant growth. The growth of winter wheat is so heavy that some fields are beginning to appear yellow because of a lack of nitrates. Crops have shown an unusual response to nitrate fertilizers this season.

A spring grain nursery was sown on April 28 in the Grande Ronde Valley east of the Blue Mountains. Many spring sowings have not yet emerged, but fall-sown grain has made a heavy growth. Stands of all crops on the Union Experiment Station, located in this area, are excellent. In many years, stands of winter grains are thinned by soil blowing.

Warm weather prevailed during the latter half of April at Pendleton, and as there is adequate soil moisture crops should make a steady growth. Indications are that winter grains may mature earlier than usual. The maximum temperature during April was 77° on the 29th, and the minimum was 24° on the 1st. Total rainfall for the month was 1.98 inches, compared with 3.61 inches for April 1937, and a normal of 1.54 inches.

CALIFORNIA

BIGGS RICE FIELD STATION, BIGGS (Rice Agronomy, L. L. Davis) (May 2)

The rainfall for April totaled 2.15 inches, which brings the total for the season, or from October 1, 1937, to 30.98 inches. The 24-year average rainfall for the same period is 18.12 inches. This season's rainfall is the highest since the records were started in 1913 at the Rice Station.

Rice seeding is late in California this year. Plowing is perhaps half completed, but progress is slow owing to intermittent showers. No rice has been seeded in the principal rice growing area of California to date.

Plowing is almost completed on the Station but seeding will not start until about May 10. Should bad weather continue seeding will be delayed still further.

UNIVERSITY FARM, DAVIS (Cereal Agronomy, C. A. Suneson) (Apr. 30)

The winter-sown small grains in the Sacramento Valley are all in head now. In general, the yield outlook is not good, despite an abundance of soil moisture. Weeds (wild oats and mustard) are providing a lot of competition and growth is so lush that lodging will probably be severe. Many spots have not yet recovered the normal green color after enduring prolonged saturation. Barley scald continues to ravage susceptible varieties, but despite its abundance it has not been found on any wheat varieties. Barley scald and septoria of wheat have severely attacked culms and glumes of many varieties. Net blotch (barley) is developing fast now. Leaf rusts are abundant on both wheat and barley; but despite its over-wintering here stem rust has not yet appeared on other than volunteer plants. Crown rust of oats is fairly abundant on both the cultivated and wild species. Foot rots on both wheat and barley are especially bad in the Montezuma hills.

Temperatures and precipitation since mid-March have been near normal.

A considerable acreage of barley was sown here as soon as fields could be worked (about April 1), and increase fields of (Martin x Baart^{7}) x(Hope x Baart^{6}) also were sown.

An unusually heavy snow pack continues to threaten many areas in the San Joaquin. In the Sacramento Valley, flood causeways have been carrying a lot of water continuously since December.

C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 May 25, 1938 No. 7

Personnel (May 11-25) and Field Station (May 1-15)

PERSONNEL ITEMS

Dr. B. B. Bayles returned to Washington on May 18 from his trip in the South and on May 22 he left for Cincinnati, Ohio, where he was to attend the Annual Meeting of the American Association of Cereal Chemists from May 23 to 27 and to present a paper entitled "Improvement of Soft Red Winter Wheats." After the meetings Dr. Bayles will proceed west to visit field stations and State agricultural experiment stations for the purpose of looking over cooperative cereal experiments, especially with wheat, and to study varieties and hybrids in breeding nurseries. His itinerary will include stops in Kentucky, Indiana, Illinois, Tennessee, Missouri, Kansas, Nebraska, and West Virginia. Later he will also go to Ohio, Michigan, Wisconsin, Pennsylvania, New York, and northern Illinois and Indiana.

Dr. Allan D. Dickson was authorized to attend the Annual Meeting of the American Association of Cereal Chemists at Cincinnati, Ohio, May 23 to 27 and to present two papers entitled respectively "Barley and Malt Studies. V.--Experimental Malting of Barleys Grown in 1937" and "A Comparison of Methods for the Determination of Diastatic Power in Malts."

Dr. M. N. Pope and Mr. J. W. Taylor spent 5 days beginning May 12 in looking over cooperative barley, wheat, and oat nurseries at Appomattox, Blacksburg, Staunton, Glade Spring, and Manassas, Virginia, and Statesville and Swannanoa, North Carolina.

Mr. Sidney R. Snider was authorized to attend the Annual Meeting of the American Association of Cereal Chemists to be held at Cincinnati, Ohio, May 23 to 27.

RECENT PUBLICATIONS

Bastards of the World Unite! A Review. J. H. Kempton. Jour. Heredity 29(1): 33-35. January 1938.

Resistance of Certain Corn Hybrids to Attack of Southern Corn Rootworm. J. H. Bigger, J. R. Holbert, W. P. Flint, and A. L. Lang. Jour. Econ. Ent. 31(1): 102-107, figs. 1-5. February 1938. (Cooperative investigations of the Division of Cereal Crops and Diseases, the Illinois Agricultural Experiment Station, and the Illinois State Natural History Survey.)

Combating Corn Diseases in Illinois. Benjamin Koehler and James R. Holbert. Ill. Agr. Expt. Sta. Circ. 484, 35 pp., 22 figs. March 1938. (Cooperative investigations of the Illinois Agricultural Experiment Station and the Division of Cereal Crops and Diseases.)

The Influence of Four Mosaic Diseases on the Plastid Pigments and Chlorophyllase in Tobacco Leaves. Paul D. Peterson and H. H. McKinney. Phytopathology 28(5): 329-342. May 1938.

Influence of Environment, After Seedling Emergence, on Covered Smut in Barley. V. F. Tapke. (Phytopath. Note) Phytopathology 28(5): 370-371. May 1938.

A New Pathogenically Distinct Race Derived from a Cross Between Tilletia tritici and T. levis. C. S. Holton. (Phytopath. Note) Phytopathology 28(5): 371-372. May 1938. (Cooperative investigations of the Division of Cereal Crops and Diseases and the Washington and Idaho Agricultural Experiment Stations.)

A New Pathogenically Distinct Race Derived from a Cross between Tilletia tritici and T. levis. C. S. Holton. (Phytopath. Note) Phytopathology 28(5): 371-372. May 1938. (Cooperative investigations of the Division of Cereal Crops and Diseases and the Washington and Idaho Agricultural Experiment Stations.)

Increase in Vitamin A Activity of Corn Caused by Doubling the Number of Chromosomes. L. F. Randolph and David B. Hand. Science 82(2263): 442-443. May 13, 1938. (Cooperative investigation of the Division of Cereal Crops and Diseases and the Departments of Botany and Dairy Industry, New York State College of Agriculture, aided by a grant from the Committee on Radiations of the National Research Council.)

I M P O R T A N T

MEMORANDUM FOR FIELD STATIONS

Re Vouchers. Because a new accounting system is being installed in the Bureau, beginning at once, please submit vouchers with the number of copies shown below; the original voucher is to be signed as formerly.

Form 1013 (Payrolls). Send to Washington white original, one white carbon copy, and two yellow carbon copies, keeping one yellow carbon for yourself.

Form 1034 (Purchase vouchers). Send to Washington white original with two yellow carbon copies, keeping one yellow carbon for yourself.

Form 1012 (Reimbursement voucher). Send to Washington white original and one yellow carbon copy, keeping one yellow carbon for yourself.

H. S. Smith
Jr. Administrative Assistant.

ADMINISTRATIVE NOTES

Names of payees should be written the same way on each succeeding payroll; that is, if "John H. Smith" is written on one payroll, do not sign "John Smith" on later payrolls.

In requesting appointments for laborers, etc., please request that the effective dates be the dates on which the men will actually start work. We have numerous cases where men report on days other than the effective dates, and in every case change in appointment must be requested. Of course, there always will be cases where it cannot be done, but care should be used.

H. S. Smith
Jr. Administrative Assistant.

ANNUAL REPORT OF PUBLICATIONS AND MANUSCRIPTS

DIVISION OF CEREAL CROPS AND DISEASES

CALENDAR YEAR 1937

In the calendar year 1937, 125 articles, papers, and abstracts were published in the various series of Department publications, in publications of cooperating State agricultural experiment stations, in private journals, or as mimeographed unnumbered publications. In 1937, 134 manuscripts were submitted for publication. There remain unpublished as of December 31, 1937, 45 manuscripts submitted in 1937 and 2 submitted in 1936.

GENERAL OR MISCELLANEOUS

Bever, Wayne M. Influence of Stripe Rust on Growth, Water Economy, and Yield of Wheat and Barley. Jour. Agr. Research 54(5): 375-385, illus. March 1, 1937. (G-1042) (Cooperative investigations of the Division of Cereal Crops and Diseases and the Idaho Agricultural Experiment Station.)

Boyle, L. W., and McKinney, H. H. Trichomes of Incidental Importance as Centers for Local Virus Infections. Science 85: 458-459. May 7, 1937.

Burnett, L. C. A Seed Dropper for Cereal Nursery Rows. (Note) Jour. Amer. Soc. Agron. 29(5): 419-420, illus. May 1937. (Cooperation between the Iowa Agricultural Experiment Station and the Division of Cereal Crops and Diseases.)

Caldwell, Ralph M. Rhynchosporium Scald of Barley, Rye, and Other Grasses. Jour. Agr. Research 55(3): 175-198, illus. August 1, 1937. (G-1057) (Cooperative investigations by the Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture, and the Departments of Plant Pathology and Botany of the University of Wisconsin, and the Department of Botany, Purdue University Agricultural Experiment Station.)

Dillman, A. C. Precipitation in Central Dakotas, 1869-1936. Dakota Farmer 57: 262. May 8, 1937.

Flint, Lewis H., and McAlister, E. D. Wave Lengths of Radiation in the Visible Spectrum Promoting the Germination of Light-Sensitive Lettuce Seed. Smithsn. Misc. Collect., v. 96, no. 2, 8 pp., illus. June 16, 1937. [Pub. 3414]

Humphrey, Harry B. [Book Review] Der Schwarzrost, seine Geschichte, seine Biologie, und seine Bekämpfung in Verbindung mit der Berberitzenfrage. By Ernst Lehmann, Hans Kummer, and Hans Dannenmann. Pp. 584, 87 text figs., and 1 col. pl. Munich and Berlin: J. F. Lehmanns. [1937.] U. S. Dept. Agr., Agr. Library Notes 12(11): 608-609. November 1937. [Mimeographed.]

Hurd-Karrer, Annie M. Selenium Absorption by Crop Plants as Related to Their Sulphur Requirement. Jour. Agr. Research 54(8): 601-608, illus. April 15, 1937. (G-1050)

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Johnson, A. G. [Book Review] Introduction to Research on Plant Diseases. By A. J. Riker and Regina S. Riker. 117 pp., illus. 1936. [Published by the authors, University of Wisconsin. $2.65.] Phytopathology 27(12): 1184. December 1937.

_____, Haskell, R. J., and Leukel, R. W. Treat Seed Grain. U. S. Dept. Agr., Misc. Pub. 219 rev., 7 pp., illus. 1937.

Katsura, Saburo K., and Johnson, A. G. The Green Muscardine Fungus on the Periodical Cicada. Science 86(2223): 128. August 6, 1937.

Kephart, L. W. Quackgrass. U. S. Dept. Agr., Bur. Plant Indus., Div. Cereal Crops and Diseases [Unnumb. Pub.], 4 pp. June 19, 1937. [Mimeographed.]

Lefebvre, C. L., and Johnston, C. O. Kansas Mycological Notes, 1935. Trans. Kans. Acad. Sci. 39: 95-101. [1937] (Cooperative investigations of the Kansas Agricultural Experiment Station and the Division of Cereal Crops and Diseases.)

[Levine, M. N., compiler.] Report of the Cooperative Uniform Cereal-Rust Observation Nurseries for the Year 1935. U. S. Dept. Agr., Bur. Plant Indus. Div. Cereal Crops and Diseases [Unnumb. Pub.], 40 pp. [Jan. 15, 1937.] [Mimeographed.]

_____ Report of the Cooperative Uniform Cereal Rust Observation Nurseries for the Year 1936. U. S. Dept. Agr., Bur. Plant Indus., Div. Cereal Crops and Diseases [Unnumb. Pub.], 41 pp. June 28, 1937. [Mimeographed.]

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Martin, Lawrence F., McKinney, H. H., and Boyle, L. W. Purification of Tobacco Mosaic Virus and Production of Mesomorphic Fibers by Treatment with Trypsin. Science 86(2234): 380-381. October 22, 1937. (Cooperation between the Food Research Division, Bureau of Chemistry and Soils, and the Division of Cereal Crops and Diseases, Bureau of Plant Industry.)

McCall, M. A. Application of Science to Greenkeeping. The Greenkeepers' Reptr. 5(2): 7-9, 33. March 1937.

McKinney. H. H. Virus Mutation and the Gene Concept. Jour. Heredity 28(2): 51-57, illus. February 1937.

Nelson, O. A., and Leukel, R. W. Experiments with Certain Copper Compounds as Bunt Fungicides. U. S. Dept. Agr. Circ. 452, 8 pp. November 1937. (Cooperation between the Division of Insecticide Investigations, Bureau of Entomology and Plant Quarantine, and the Division of Cereal Crops and Diseases, Bureau of Plant Industry.)

Parker, J. H. Crop Improvement in Kansas. Northwest. Miller 190(7): 40-46. June 9, 1937. (Cooperative investigations of the Division of Cereal Crops and Diseases and the Kansas Agricultural Experiment Station.)

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Snider, S. R., and Coleman, D. A. Soluble Starch: A Study of Its Properties with a Recommended Supplementary Procedure for Determining Its Suitability for Use in the Lintner Determination. Cereal Chem. 14(1): 1-17. January 1937. (Cooperation between the Division of Cereal Crops and Diseases, Bureau of Plant Industry, and the Milling and Baking Investigations, Grain Division, Bureau of Agricultural Economics.)

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BARLEY

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Dickson, J. G. Progress in Barley Improvement. Brewery Age 4: 62-66. March 1937. (Cooperative investigations of the Division of Cereal Crops and Diseases and the Wisconsin Agricultural Experiment Station.)

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FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

LOUISIANA

RICE EXPERIMENT STATION, CROWLEY (Rice Agronomy, J. M. Jenkins) (May 13)

The precipitation was rather light in the first two weeks of April but sufficient for seedbed preparation and for seeding, and in most localities enough to cause good germination of rice. There was, however, not enough rain to fill the streams for irrigation purposes. For a while there was uneasiness for fear the streams would become contaminated with salt water from the Gulf. This situation was relieved by heavy rains on the 18th to the 20th, but there was practically no rain during the remainder of the month. This permitted rice seeding to continue, and by the end of the month the greater part of the commercial crop had been sown.

Rice seeding on the Station was begun as soon as possible after the heavy rains of the 18th and 20th and progressed satisfactorily. Rices are up to a good stand in the date-of-seeding experiment.

Temperatures were about the same as in April 1937. The maximum was 88°, the minimum 35°, and the monthly mean 67°. The total precipitation was 4.05 inches, 2.55 inches more than in April last year, and 0.47 inch more than the 28-year average.

On April 12 the Superintendent took part on the annual spring visitor's day program at the Rice Branch Experiment Station, Stuttgart, Ark. There were about 500 persons in attendance. The interest and attention was exceptionally good.

Mr. Bonifacio Bernardes, Instituto de Arroz, Porto Algere, R. G. do Sul, Brazil, was a visitor in Crowley the week beginning April 17. During his stay, he visited the Station several times. Accompanied by the Superintendent he made inspection trips for the purpose of acquainting himself with the method of growing rice in the vicinity of Crowley.

TEXAS

SUBSTATION NO. 6, DENTON (Wheat Improvement, I. M. Atkins) (May 10)

Stem rust was found in an increase field of oats on the Substation today. Three infection centers were found and they no doubt have been present for some time as the stems of the plants were quite thoroughly covered with pustules. In the rush of work there has not been opportunity to search for the disease in field plantings. No infection centers have been found in the experimental plantings.

Crown rust is reaching important proportions and is well distributed in commercial fields. Fall oats will probably mature without injury but it appears now that spring oats may be injured. Further spread will of course depend upon weather conditions.

(May 15)

Weather conditions during the first half of May have been favorable for small grains and rather unfavorable for the spread of wheat stem rust. Minimum temperatures have been below 60° on 12 of the 15 days. The mean temperature for the first half of the month was 67°, or 4° below normal. The precipitation amounted to 0.94 inch in three showers. Dews occurred on 9 days. Seven days were partly cloudy.

These conditions have permitted only a slow spread of stem rust. In the mean time wheat on farms has in most instances reached full head, and early fields of Fultz and Red May wheat have nearly reached maturity. Some harvesting will start this week. A large amount of inoculum of stem rust is being built up in this area but it seems at present that the majority of fields will escape serious damage. Very late maturing fields and early infection centers of some fields will probably be damaged.

Experimental wheat at the Substation ranges in maturity from fully ripe in such varieties as Missouri Early Premium and Early Kanred to not quite full head for the later varieties of the Turkey type. In the experimental plantings stem rust will damage very susceptible varieties and those late in maturity. Early varieties of wheat, except where injured by the April freeze, have matured a fine crop. Leaf rust continues to be a serious factor in the growth of wheat.

Fall-sown barley is nearly all mature. Most of the nursery has been harvested and the variety test was harvested May 13. Yields of barley will be high, and quality should be excellent. Fall-sown oats have started to ripen. Spring-sown oats are heading. Corn rust has spread rapidly and it appears now that spring oats will be damaged considerably. Stem rust has also appeared. Fall oats in commercial fields are exceptionally fine.

KANSAS

AGRICULTURAL EXPERIMENT STATION, MANHATTAN (Wheat Leaf Rust, C. O. Johnston) (May 21)

The winter wheat crop in Kansas has not made as rapid progress during May as was expected on its early condition. The freezes in April and unusually cool weather during the first half of May have greatly retarded development. Although much of the wheat as far north as Manhattan is now headed, many fields are only partly headed and have a very ragged appearance. In the south-central part of the State many fields have headed in patches and some plants apparently have stopped development in the boot and will never head. This obviously is the result of the April freezes. There are several manifestations of frost damage including constriction, blackening, and breaking in the nodal regions, buckling of the stems in the lower internodes, failure of the head to emerge from the boot, combined with a silvery color of the leaf sheaths and drying of the leaves, blasting of the tips of the spikes, and the presence of sterile or blasted spikelets in portions of the heads. The differences in plant response apparently is due to differences in the stage of growth at the time of the frost as well as to differences in the minimum temperature.

Leaf-rust infection is extremely heavy on winter wheat throughout the whole Plains area. Early defoliation due to heavy leaf rust infection already is occurring in south-central Kansas. Reductions in yield traceable to leaf rust are certain to occur in all parts of Kansas but are likely to be underestimated owing to very favorable growing conditions which will tend to raise the general yield level. Excellent rains have fallen over much of Kansas at intervals of a few days since May 1. The ground now is thoroughly soaked and many rivers are near the flood stage.

The first stem rust of wheat was found at Manhattan on May 11 and also was reported from Salina and McPherson on that date. It was reported from Barber, Sumner, and McPherson Counties on May 12. Only occasional primary pustules, mostly on flag leaves, have been found so far.

Hypodermic inoculations with leaf rust and crown rust have been completed. Artificial inoculations with stem rust of wheat were begun on May 13 and will be started for oat stem rust today.

FORT HAYS EXPERIMENT STATION, HAYS (Cereal Agronomy, A. F. Swanson) (May 15)

The rainfall for the first 15 days of May, amounting to 2 inches, has been sufficient to maintain the growth of wheat, oats, and barley in good condition. The rainfall has not been sufficient, however, to build up reserve moisture for the fruiting period. The outcome of the crop to a considerable degree will therefore depend on current rainfall.

Leaf rust is prevalent on the lower leaves of many varieties but stem rust has not yet appeared.

A low temperature of 28° was recorded on the morning of May 8, which seemingly has caused more or less injury to Early Blackhull where grown on farms. Examination of the florets of Early Blackhull brought in from farms indicate that fertilization has not taken place in a number of heads. The damage has been slow to show up as the plants for the most part appear healthy and strong. There is quite a scattered acreage of Early Blackhull in a territory southwest of Hays from which many complaints have come.

While the winter wheat prospects are promising for the most part in this territory, the crop is still subject to several hazards. The stored moisture is rather low and the possibility of rust in some form or another must be considered. On the other hand the crop is well advanced and the normal high rainfall period is just ahead to coincide with the fruiting period.

The first date of sorghum planting will be made as soon as the fields are dry. The seedbed is in good condition for planting.

NEBRASKA

AGRICULTURAL EXPERIMENT STATION, LINCOLN (Wheat Improvement, K. S. Quisenberry) (May 21)

Crop conditions at Lincoln have changed a little since the last report. The weather has been damp and cool with many cloudy days. Nebraska is rapidly becoming one of the wet spots. Already the normal rainfall for May has been received and the prediction is still "cloudy and showers probable."

Small grains have made a very heavy vegetative growth, but maturity seems to have been slowed up. Dakold rye was headed on May 14, 4 days earlier than last year. Nebraska No. 28 is starting to head and will be about 2 days earlier than in 1937.

It seems impossible for Early Blackhull to head before May 24 or 25, which will be later than last year. Already the winter wheats are as tall as they were at harvest last year. Leaf rust has developed very rapidly and will undoubtedly become heavy enough to make possible the obtaining of good notes. As yet no stem rust has been reported in Nebraska.

The growth of all spring grains has been rapid. One or two strains of barley have started to head. Leaf rust may be found on the spring wheats.

Today, on a drive south and east of Lincoln, winter wheat was observed that was starting to head. Only occasional fields were so far advanced with the heads in many fields still in the boot. Near the Kansas line many fields were fully headed and, due to heavy rains, were lodging in low places. Leaf rust infection is heavy south of Lincoln.

Reports from western Nebraska indicate that wheat is making a heavy growth there. There has been some hail damage in scattered areas but for the most part the crop seems to be in good condition. Leaf rust has been found as far west as Kearney.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (May 17)

The weather during the first half of May was generally favorable for crop development and field work except for deficient precipitation, some high winds, and freezing temperatures. Precipitation for any 24-hour period was less than 0.2 inch. High winds caused some soil blowing damage to crops on farms in this locality but practically no damage on the experiment station land where the surface was left rough. Below-freezing temperatures were recorded on 4 successive nights May 5 to 8. A temperature of 23° on the night of the 6th damaged barley slightly but caused no noticeable injury to the earlier sown wheat and oats. The maximum temperature was 71° on the 1st and the minimum, 23° on the 6th. Precipitation was 0.30 inch.

Stands of wheat and oats appear excellent in both plots and nursery. Barley stands are fair. The earliest wheat is about 5 inches tall. Winter rye on the Station is heading. Crops in general over the country in this locality appear in excellent condition except where soil blowing has occurred. Some damage by cutworms has been reported. Cutworms and grasshoppers appear to be plentiful but have done little perceptible damage to date.

The flax 9-row and 3-row nurseries were sown May 9 to 11 and the varietal plots May 12. High winds on the 13th and 14th prevented further seeding on those days. Seeding of the flax nursery on flax-sick soil was started on the morning of May 16 but was discontinued at noon on account of high winds.

The situation at this time (8 A.M., May 17) appears exceptionally favorable. The precipitation last night amounted to 0.41 inch and rain is falling in a slow, steady drizzle that promises to continue for some time.

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (May 16)

The weather has been variable this month with frequent cold winds. Several bad dust storms, especially those on May 13 and 14, did considerable damage in this area. No serious damage at the Substation has been done by soil blowing as the fields were left rough enough to prevent damage from this source. Only a few light showers of rain have occurred this month to date but showers are forecast for today and are badly needed.

Cereal crops in field and nursery have fairly good stands but have made rather slow growth owing to cool weather and lack of moisture.

It is planned to plant corn varieties and sow flax varieties this week if weather and moisture conditions permit.

UTAH

AGRICULTURAL EXPERIMENT STATION, LOGAN (Cereal Agronomy, R. W. Woodward) (May 17)

Although the spring here was cold and backward, crops generally have made remarkable growth in April and so far in May.

Winter wheat that emerged before winter set in shows excellent growth and stands. With more than 1 inch of rain during the past two days conditions are ideal for bumper crops of both winter and spring cereals. A minimum temperature of 24° on May 6 did some damage to alfalfa and fruits. The total precipitation for April was 1.67 inches and for the period from May 1 to 17 1.50 inches.

Spring cereal crops were seeded the middle of April and have made more than usual growth for the past month. No irrigation will be needed until June.

Some corn has already been planted and has emerged. Over 100 acres of U. S. 52, a double cross, is being grown in commercial fields throughout the State. This is the first attempt to grow a commercial hybrid corn in Utah, although small plot tests indicate the superior value of adapted corn hybrids.

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CEREAL COURIER

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 June 10, 1938 No. 8

Personnel (May 26-June 10) and Field Station (May 16-31)

PERSONNEL ITEMS

Mr. J. Allen Clark will leave Washington about June 14 on his annual field trip through the hard red spring wheat region. His itinerary will include stops in Wisconsin, Minnesota, North Dakota, South Dakota, Nebraska, Colorado, Montana, Wyoming, and Manitoba.

Dr. M. T. Jenkins has been authorized to attend the meetings of the Corn Belt Section of the American Society of Agronomy to be held at Columbia, Mo., June 21 to 23. Before or after the meetings Dr. Jenkins will visit the agricultural experiment stations in Tennessee, Louisiana, Missouri, and Kansas.

Dr. A. G. Johnson left Washington June 4 for Leavenworth, Kans., to take data on the wheat flag smut experiments conducted in cooperation with the Kansas Agricultural Experiment Station. Later he will stop at Manhattan.

Mr. C. H. Kyle left Washington June 8 to spend the season at Tifton, Georgia, selecting and pollinating corn and to visit the agricultural experiment stations in Georgia, Florida, South Carolina, and North Carolina.

Dr. S. C. Salmon has been authorized to attend the meetings of a western weed control conference to be held at Denver, Colo., on June 16. After the conference he will visit experiment stations in Colorado, Kansas, Nebraska, Iowa, and Minnesota.

Dr. G. A. Wiebe left Washington June 4 on a tour of the barley-growing area to take notes on cooperative experiments and to confer with personnel of the Division and officials of agricultural experiment stations regarding cooperative barley research. His itinerary will include stops in Maryland, Pennsylvania, Ohio, Kentucky, Indiana, Illinois, Missouri, Kansas, Nebraska, Colorado, Wyoming, Idaho, South Dakota, North Dakota, Minnesota, Iowa, Wisconsin, and Michigan.

RECENT PUBLICATIONS

J. Foster Martin and Roderick Sprague. Relative Effectiveness of Controlling Different Physiologic Races of Bunt by Seed Disinfection. Jour. Amer. Soc. Agron. 30(5): 390-394. May 1938. (Contribution from the Division of Cereal Crops and Diseases and the Oregon Agricultural Experiment Station.)

K. S. Quisenberry. Survival of Wheat Varieties in the Great Plains Winter-hardiness Nursery, 1930-1937. Jour. Amer. Soc. Agron. 30(5): 399-405. May 1938.

J. V. Srb, L. S. Evans, and F. D. Keim. Cost of Bindweed Eradication by the Tillage Method. Jour. Amer. Soc. Agron. 30(5): 425-429. May 1938. (Contribution from the Department of Agronomy, Nebraska Agricultural Experiment Station, and the Division of Cereal Crops and Diseases.

E. R. Ausemus, M. C. Markley, C. H. Bailey, and H. K. Hayes. Quality Studies in the Wheat-Breeding Program at the Minnesota Agricultural Experiment Station. Jour. Agr. Research 56(6): 453-464. March 15, 1938. (G-1088) (Cooperative investigations conducted by the Division of Cereal Crops and Diseases and the Minnesota Agricultural Experiment Station.)

(PUBLIC--NO. 510--75TH CONGRESS)
(CHAPTER 210--3D SESSION)
(H. R. 6656)

AN ACT

Making the 11th day of November in each year a legal holiday. Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the 11th day of November in each year, a day to be dedicated to the cause of world peace and to be hereafter celebrated and known as Armistice Day, is hereby made a legal public holiday to all intents and purposes and in the same manner as the 1st day of January, the 22d day of February, the 30th day of May, the 4th day of July, the first Monday of September, and Christmas Day are now made by law public holidays.

Approved, May 13, 1938.

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

LOUISIANA

RICE EXPERIMENT STATION, CROWLEY (Rice Agronomy, J. M. Jenkins) (June 3)

Temperatures in May were about normal. The maximum was 90° and the minimum 53°.

The total precipitation was 1.43 inches, the lowest since 1928. The 28-year average precipitation for May is 5.06 inches. The total precipitation for the first five months of 1938 is about 5 inches less than for the same period in 1936 and 1937, and 9 to 15 inches less than for the same period in the 4 years, 1932-35.

Unless heavy rains occur within the next few weeks in the vicinity of the streams and lakes that furnish water for rice irrigation, there will be a serious water shortage.

The light rainfall not only results in a shortage of water in the streams and lakes but adds greatly to the cost of pumping operations of both Commercial Canal Companies and privately owned wells.

Work on the Station is progressing satisfactorily. The rice stands are, in the main, good. It has been necessary, however, to irrigate some seedings one or more times before a good stand was obtained.

The stands of cotton are not so good as usual. Low temperatures retarded germination and there was much dying, especially on land that has been seeded continuously to cotton for several years. Most of the cotton had been thinned by the end of May.

Dr. Y. Watanabe, Professor of Agricultural Economics, Imperial University, Kyoto, Japan, was a visitor May 19.

IOWA

AGRICULTURAL EXPERIMENT STATION, AMES (Crown Rust of Oats, H. C. Murphy) (June 1)

A moisture deficiency of 6.59 inches at Ames, Iowa, in 1937, accumulated during the last four months of the year, has been alleviated by an excess precipitation of 6.43 inches during the first five months of 1938. The average temperature for January and February was above normal and the precipitation slightly below normal. March and April were warm and wet. May also was wet, with a total precipitation of 8.24 inches, which is 3.84 inches above normal.

The heavy rainfall and an excess of cloudy weather in April and early May resulted in much yellowing and stunting of oats in Iowa. Possibly some of this condition was due to pythiaceous fungi; but lack of available nitrogen, due to leaching and water logging, and lowered photosynthetic activity probably were the most important contributing factors. The roots of plants showing stunting and yellowing, in general, did not show disease symptoms.

Much of the yellowing and stunting in small grains that was evident during the first half of May has been overcome by a rich green color and rank growth resulting from the warmth and sunshine of the past week. All small grains have stooled profusely, resulting in a dense stand that has largely choked out the weeds, and growth has been so rank that there is danger of lodging, particularly in the winter wheat.

Leaf rust on winter wheat was first observed at Ames on May 4. It has now developed until some of the more susceptible varieties show 40 percent infection. Most of the varieties are in the boot stage, only a few showing first heading. Continued favorable weather certainly will result in heavy losses traceable to leaf rust. Both Septoria and mildew are unusually prevalent on winter wheat. Mildew infection is the heaviest the writer has observed during the last decade at Ames. Certain varieties and selections such as Iowin appear to be highly resistant to the current epiphytotics of both mildew and leaf rust.

Hypodermic inoculations of rust spreaders in the oat nursery were started for crown rust on May 18 and for stem rust on June 1. Infection centers of crown rust now are well established throughout the nursery. Crown rust infection under natural field conditions was first observed by D. R. Shepherd and the writer near Ellsworth, Iowa, on May 24, where it apparently had spread from an adjacent, heavily infected European buckthorn hedge, that had been cut off and piled about May 10. Because of unusually heavy infection on most of the buckthorns in Iowa it is probable that local centers of crown rust infection on oats are now well established throughout the State. Continued favorable weather for rust development may result in heavy reductions in yield because of leaf and crown rust. So far the writer has not seen stem rust on wheat or oats in Iowa.

MINNESOTA

AGRICULTURAL EXPERIMENT STATION, UNIVERSITY FARM, ST. PAUL (Wheat Breeding, E. R. Ausemus) (June 2)

Weather conditions in May have been favorable for cereals. Temperatures have been cool and, together with frequent rains, have resulted in a luxuriant growth. Early sown spring wheat is nearly as far along in growth as winter wheat. The rainfall for May was 7.65 inches, as compared with a normal of 3.67 inches. This makes an excess of 4.71 inches since Jan. 1, 1938. The maximum temperature was 84° on May 2 and the minimum, 33° on May 7.

Leaf rust was found uniformly distributed in the winter and spring wheat nursery and field plots on May 26. The infection was due to natural infection, since leaf rust inoculum was first placed in the winter wheat nursery on May 24. Stem rust inoculum was first placed in the winter wheat nursery on May 26 and is beginning to break through on the leaves of the Minhardi border rows today.

Corn planting has been delayed because of wet weather. In many parts of the State farmers are planting the higher areas of their land and letting the lower spots go until they dry out later.

TEXAS

SUBSTATION NO. 4, BEAUMONT (Rice Production and Improvement, H. M. Beachell) (E. C. Tullis) (June 2)

Helminthosporium leaf spot is becoming prevalent on the Substation. It is particularly abundant in the leaf spot nursery and on some lots of thickly sown rice in nearby plots. Chlorosis has appeared on early sown Blue Rose rice; the symptoms are of an extreme "white tip" type in which 2 to 3 inches of the tips of affected leaves are killed.

SUBSTATION NO. 6, DENTON (Wheat Improvement, I. M. Atkins) (May 23)

Weather conditions during the past week have not been favorable for the further spread of stem rust, with the exception of the last two days. During the first part of the week the weather was clear, and no dews were recorded. During the last two days several showers have been received, and the sky has been partly cloudy so that moisture has stayed on the grain a large part of the time. Early varieties of wheat are maturing and some harvest has started in the eastern part of the county. The Mediterranean types of wheat, however, are in the soft to hard-dough stage, and it will be June 1 before many fields are harvested. Wheat near stem rust centers, as well as some fields, will produce shriveled grain and yields will be materially reduced. Although wheat in commercial fields looks well at this time, farmers probably will be disappointed in their yields because of rust damage.

Harvest of barley on the Substation has been completed and fall-sown oats will be harvested this coming week. Crown rust of oats continues to spread rapidly, and stem rust of oats is becoming generally distributed in the experimental seedings. Spring oats, which at this time are very promising, are likely to be injured by both stem rust and crown rust.

Visitors during the past week included Mr. T. R. Stanton, Dr. Ralph Cotter, and Mr. C. O. Johnston.

(June 1)

The varietal test was harvested today and the nursery is being harvested as rapidly as possible. Fall-sown oats were harvested more than a week ago, and fall-sown barley was harvested May 13.

The writer made a 2-day trip to Chillicothe, Texas, to take notes on the winter wheat nursery at Texas Substation No. 12; on May 24, returning to Denton the next day with Dr. K. S. Quisenberry. A good crop is in prospect in that vicinity in spite of previous conflicting reports. The experimental nursery will no doubt yield some valuable data on the adaptation of the Amarillo nursery strains to that section.

The precipitation for May was 2.34 inches, or 2.18 inches below normal. The maximum temperature was 94°, the minimum, 40°, and the mean, 71.6°. The weather in general has been cool and dry and none too favorable for the spread of stem rust of wheat and oats. On May 27 the maximum temperature reached 90° and it has been above 90° each day since. The cool weather throughout most of the month enabled wheat to fill fairly well in spite of a severe rust epidemic. When the weather turned warm, wheat ripened within a few days. At this writing all the experimental wheat, as well as fields of wheat in this vicinity, is fully ripe.

The following were visitors during the month: Dr. B. B. Bayles, Dr. K. S. Quisenberry, Mr. T. R. Stanton, and Mr. C. O. Johnston, all of the Division of Cereal Crops and Diseases; Mr. D. R. Hooton, Mr. D. D. Porter, and Mr. C. A. Moosberg, all of the U. S. Cotton Breeding Station, Greenville, Texas; Mr. J. R. Quinby, Supt., Texas Substation No. 12, Chillicothe, Texas; and Mr. W. M. Osborn, U. S. Field Station, Lawton, Okla.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Grain Sorghum and Broomcorn, J. B. Sieglinger) (June 2)

Weather conditions affecting this year's sorghum crop have been generally humid. The precipitation for May was 8.33 inches in 18 showers compared with an average of 3.50 inches. A total of 17.20 inches was recorded for the first five months of 1938 compared with an average of 8.82 inches. Temperatures have not reached their usual maximum. Farmers' reports indicate that poor or no stands have resulted from sorghum planting to date.

The soil of the sorghum and broomcorn project is well supplied with moisture and is more nearly comparable with fallowed than with cropped land. The first date-varietal seeding of broomcorn was made June 1.

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (June 1)

Cool and unusually wet weather has delayed maturity of cereals at Woodward fully a week. The nursery and field plots have a yellow cast and harvest of a few of the earlier strains will start about June 6. Missouri Early Beardless barley will be cut this week.

All cereals are unusually tall and several winter wheat varieties are more than 60 inches in height. Many varieties lodge with each shower and, as is expected, fewer and fewer straighten up again as maturity approaches.

The cool weather also delayed the development of leaf and stem rust. Leaf rust developed appreciably later in northwestern Oklahoma than in the central and southwestern portions. Despite this, infections of 75 and 80 percent are much more common than those below 50 percent. It is estimated that leaf rust will reduce yields from 10 to 25 percent. Stem rust was first noted on May 19 and at present infection does not average more than a trace though a few plants show about 10 percent of infection.

Two field days for the inspection of cereals were held in May. One, on May 21, was for County Agents and Vocational Agriculture Instructors and the other, on May 26, was for farmers. About a dozen individuals attended the former and about 50 farmers from six counties and several from the Panhandle of Texas attended the latter.

A meeting of grain dealers from five counties in northwestern Oklahoma on May 25 estimated that wheat yields would range from 10 to 20 bushels per acre. The average of the estimates was 15 bushels per acre.

Grasshoppers are thick and poison bran is being distributed by county officials.

Maximum, minimum, and mean temperatures in May were 94° on the 28th, 33° on the 7th, and 66°, respectively.

KANSAS

FORT HAYS EXPERIMENT STATION, HAYS (Cereal Agronomy, A. F. Swanson) (May 30)

Wheat at the moment commands a great deal of attention in Kansas with continued improvement in the eastern half of the State. The prospects are for a large crop, although lodging, leaf rust, and a wet harvest may yet cause considerable losses. Wheat in the Hays section ranges from the early blooming stages to soft dough, depending on the variety. The low temperature of 28° on May 8 has caused some sterility, ranging from zero to as high as 35 percent. High sterility appears to be associated with succulent late tillers, which developed rapidly on well prepared seedbeds. Where the wheat underwent some punishment early in the season sterility is almost fully absent. However, in the case of Early Blackhull sterility is quite common in the main heads. Very little damage occurred in the late varieties of wheat. There was little damage from this source in northwestern Kansas. In the vicinity of Hays injury was rather marked in the medium-early varieties.

Leaf rust ranges from almost zero to 100 percent, depending on the variety. In certain varieties full development of leaf rust came at the time of the blooming period. Early Blackhull is heavily infected with leaf rust, but the variety seemingly is now too far advanced to be seriously injured from this cause. No stem rust has as yet been noted.

Oats and barley give promise of very large yields if favorable weather continues to prevail.

The first planting of sorghum was completed today after a delay of 10 days due to rains.

COLORADO

AGRICULTURAL EXPERIMENT STATION, FORT COLLINS (Wheat Improvement, J. J. Curtis) (June 2)

The winter wheat nursery at Fort Collins has made rapid growth during May. The wheat is heading at present. Some of the weaker-strawed varieties will lodge if the June rainfall is normal. Yields should be high at Fort Collins.

Winter wheat at Akron is headed. The winter wheat varietal experiment and the rate-and-date-of-seeding experiment promise to make above normal yields. The winter wheat nursery is uneven in growth because some of the plants emerged in the fall and some emerged in the spring.

Spring wheat, barley, and oats at Akron are making rapid growth. Stands are good. Present conditions indicate that the yields should be higher than usual.

So far no stem rust has been found at either Akron or Fort Collins.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (June 1)

Climatic conditions during the last half of May were favorable for crop development. During the 5 days from May 16 to 20 the rainfall was almost continuous and amounted to over 2 inches. Showers on other days brought the total precipitation for the last half of May to 2.12 inches. Temperatures were somewhat below normal but not below freezing at any time. The maximum temperature was 77° and the minimum, 36°. High winds on some days caused some soil blowing on farms in this locality.

The flax nursery seeding was completed May 26. Stands of flax seeded in the nursery before the rain are good. Stands in the plots are only fair because crusting of the soil surface prevented complete emergence. Flax sown after the rain is emerging with good stands.

Wheat, oats, and barley have made good leaf growth but are not yet beginning to head.

Leaf rust on wheat was first noted May 31. The infection is generally distributed over the plots and nursery and some leaves are almost completely covered with pustules. No stem rust has been noted and no rust of any kind on oats or barley.

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (May 31)

There has been a marked improvement in weather and crop conditions since the middle of May. Beginning May 17, four days of mist and drizzle supplied 1.97 inches of moisture. Several good showers since have brought the total for May up to 3.32 inches and the total precipitation for the year up to 5.93 inches, which is 0.87 inch above normal for the latter period. The cool, moist weather has caused cereal crops to look better at this time than for several years.

Corn varieties in field plots and nursery and flax and proso varieties in field plots were seeded during the past week, seeding being delayed by the wet weather. Stand notes on plots and nursery show fairly good stands in all spring crops that have emerged. Owing to lack of stand in winter grain the rye plots and winter wheat nursery were duckfooted to destroy weeds. Field plots of winter wheat are thin and irregular in stand but may revive enough to be saved for harvest.

Field plots and nursery have been trimmed and the nursery cultivated.

The last killing frost was on May 9, with a minimum of 25°. The maximum temperature for May was 82° on the 28th.

AGRICULTURAL EXPERIMENT STATION, STATE COLLEGE STATION, FARGO (Wheat Improvement, G. S. Smith) (June 1)

Although spring opened up much earlier than usual and considerable wheat was sown in March, cool weather, winds, and frequent showers in April and May have interrupted field work so that it has been difficult to complete seeding by the normal dates. Rains have not been heavy, the greatest fall, 0.72 inch, being recorded on May 30. The total for May at Fargo is 3.60, inches about an inch more than normal but the total for 1938 is still 0.42 inch short. Exact figures are not available for Langdon at this time but that area probably is above normal both for May and for the year.

The early-sown nursery at Fargo emerged slightly uneven because of dry soil but good rains since that time have brought everything up, including French weed. At Langdon the stands are excellent and weeds not yet such a problem.

In general, the Red River Valley is in excellent condition with the exception of an area southeast of Grand Forks, which has had too much water. North of Valley City almost to Langdon precipitation was very light and soil blowing severe until just recently, when conditions have been improved by showers. Injury from grasshoppers cannot yet be predicted. Evidently there are enough areas heavily infected to produce large numbers of them.

Dr. L. R. Waldron found leaf rust on wheat in his nursery on May 19.

MONTANA

AGRICULTURAL EXPERIMENT STATION, BOZEMAN (Wheat Improvement, R. H. Bamberg) (June 2)

Seeding of all grain crops on the Station was delayed this year on account of heavy rains and snow in late April and May. The total precipitation in May was 5.63 inches, the average being 2.79 inches. More than 2 inches of this came in the form of snow May 17, 18, and 19. The total precipitation from January 1 to May 31 was 11.23 inches, compared with the normal of 7.30 inches.

Spring wheat bunt nurseries were seeded May 5, 7, and 9 and yield nurseries on the 14th and 16th. Field plots were not dry enough to seed until the 26th, and some increase plots could not be put in until June 1.

All wheat nurseries have emerged with excellent stands and should make rapid growth with the abundance of moisture if clear weather continues.

Winter wheat survived with little or no winter-killing and is now 12 to 16 inches high.

Moisture conditions over most of the State are much better than for several years, in most sections approaching or exceeding normal.

CALIFORNIA

UNIVERSITY FARM, DAVIS (Cereal Agronomy, C. A. Suneson) (May 31)

Cereals in this section are beginning to ripen. The barley crop, considering only that part sown in normal season, promises to be of exceptional uniformity, plumpness, and mellowness. Late-spring-sown barley in this section (probably 1/3 of the total acreage) has just headed, and even though warm weather and severe dry winds have not harassed it, the prospects are that yields will be very light on these fields.

An exceptionally good crop of wild oat hay was harvested in this section this year. Varieties of tame oats, later in maturity than Kanota, have made very poor growth.

Stem rust is damaging wheat considerably in southern counties, and promises to be a yield factor in late sorts in the Sacramento Valley. Leaf rust is heavy in nearly all parts of the State, and stripe rust may be found in most sections. Smut is less abundant than usual in grain fields but is extremely heavy in native grasses in some sections.

Hessian fly are not so abundant in the Montezuma Hills as usual. In breeding studies, susceptible sorts are showing infestations of about 75 percent.

There was no precipitation in May. Lodging in barleys is severe but other cereals are standing well.

A field day attended by 200 farmers was held May 20. Recent visitors include Dr. M. A. McCall, Dr. S. C. Salmon, Dr. H. V. Harlan, and Miss Mary L. Martini from the Division; and Mr. R. E. White from the Portland grain supervision office.

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C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 June 25, 1938 No. 9

Personnel (June 11 - 25) and Field Station (June 1 - 15)

PERSONNEL ITEMS

Mr. F. A. Coffman left Washington on June 16 on his annual trip in Missouri, Kansas, Colorado, Nebraska, Iowa, Illinois, Idaho, Wisconsin, Minnesota, North Dakota, Montana, Washington, Oregon, and Utah in the interests of oat investigations. He will confer with officials of the State agricultural experiment stations and of Federal stations and inspect cooperative oat experiments and oat fields on farms. He will also make oat selections and obtain samples of diseased material for laboratory study.

Mr. A. C. Dillman will leave June 28 for Minnesota, South Dakota, North Dakota, Montana, Washington, and Idaho to look over cooperative experiments with flax, to classify and describe flax varieties, and confer with officials of State agricultural experiment stations and others regarding research problems with flax.

Dr. Charlotte Elliott will leave June 27 for Long Island to inspect cooperative sweet corn plots for wilt and collect mosaics of corn.

Mr. Earle W. Hanson, Dr. H. B. Humphrey, Dr. H. A. Rodenhiser, and Dr. V. F. Tapke will attend the meetings of the American Phytopathological Society to be held June 28 to 30 in connection with the summer meetings of the American Association for the Advancement of Science at Ottawa, Canada, June 27 to July 2.

Dr. H. B. Humphrey left Washington on June 20 to visit Statesville, N. C., and Chilhowie, Independence, Jackson's Ferry, and Blacksburg, Va., at which points notes were taken on uniform rust nurseries of wheat and oats. Specimens were collected and observations made on the incidence of various diseases of wheat, oats, barley, and rye. Dr. Humphrey returned on June 24.

Dr. H. A. Rodenhiser will give a talk on June 27 on the "Origin of Races in the Smut Fungi through Hybridization" at a joint symposium attended by medical men and plant pathologists to be held during the meetings of the American Association for the Advancement of Science at Ottawa, Canada, June 27 to July 2. While at Ottawa, Dr. Rodenhiser will visit the experimental plots of the Central Experimental Farm and consult with officials regarding wheat smut research.

From Ottawa he will proceed to Idaho, Utah, Washington, Oregon, Montana, Nebraska, North Dakota, Minnesota, and Illinois, where he will consult with officials of the State agricultural experiment stations regarding wheat smut experiments. He will make smut collections and take notes on nursery material.

Mr. T. R. Stanton returned on June 13 from a 4-week field trip into Tennessee, Arkansas, Texas, Oklahoma, Kansas, Missouri, Kentucky, and Virginia in the interests of oat improvement. He reports that much progress is being made in breeding oats for cold and disease resistance at several experiment stations. At Knoxville, Tenn., Mr. N. I. Hancock is increasing three of his new strains of winter oats for probable distribution to farmers this fall. These Tennessee selections appear to be more hardy and more satisfactory for late fall seeding than varieties such as Winter Turf, Lee, and Tech.

A rather heavy natural epidemic of crown rust was noted on oats at the Rice Branch Experiment Station, Stuttgart, Ark. This made possible the elimination of numerous susceptible selections from hybrid populations of crosses on Victoria and Bond. In spite of crown rust, Ferguson No. 922 and other typical strains of Red Rustproof oats that are extensively grown in the Suttgart area will make fair to good yields. The so-called "late rusting character" of these strains of Red Rustproof (Red Texas) was showing up to good advantage this year. At Fayetteville, Ark., Drs. H. R. Rosen and L. M. Weetman have started an extensive oat-breeding program, especially for the development of winter varieties adapted to Arkansas. Over 500 hybrids have been made involving resistance to cold, smut, crown rust, and stem rust.

Some promising new lines from the Victoria x Fulghum and Nortex x Victoria crosses were observed on Substation No. 6, Denton, Tex. Here an effort is being made to develop new red oats of the Red Rustproof and Fulghum types with resistance to both rusts and to smut that will be equally satisfactory for both fall and spring seeding in north-central Texas. This means the combining of resistance to disease and cold. New Nortex, a strain similar to or identical with Nortex in morphological characters but somewhat better in yield, is being increased for distribution to farmers. At Substation No. 5, Temple, Tex., a number of new hybrid strains from crosses on Victoria were observed. At Texas Technological College, Lubbock, a number of nursery rows of varieties and strains and, an increase plot of Lee winter oats were observed.

At the U. S. Field Station, Woodward, Okla., oats were in excellent condition. Of the new varieties and strains that have been tested for several years the two unnamed Kherson selections, namely, 459-6-4 and 459-2-7 are outstanding. Oklahoma selection 1446 was outstanding for winter survival in the uniform winter hardiness nursery. At Stillwater, Okla., oats likewise were in excellent condition and relatively large nurseries of both fall and spring oats were being grown by Prof. C. B. Cross. Several of the Fulghum (winter type) selections appeared to be the most promising of the winter oat varieties and strains. The Oklahoma selections, Nos. 1446 and 1460, were quite good and probably are the best new lines of winter oats so far developed at Stillwater. These resulted from selections of a mass population of a Hairy Culberson x Fulghum (winter type, C. I. 2500) cross made at Arlington, Va., in 1926. The Tennessee selections also were among the best from the standpoint of winter survival in the winter hardiness nursery.

In the regular yield test nursery at Manhattan, Kans., many selections from crosses of Markton x Fulghum, Richland x Fulghum, etc., were observed. The Fulghum x Markton selection, Kans. 6138 (C. I. 3327), apparently will again make a very satisfactory yield. An increase field of about 15 acres of Kans. 6138 for possible distribution to farmers was noted on the experiment station farm. In the cereal disease nursery the selections from hybrids of Victoria on the Fulghum selections, such as H. C. 77 and 726, appeared outstanding.

At Columbia, Mo., some of the Markton x Fulghum selections were again looking quite promising, although it is doubtful if they will eventually prove superior to Columbia. Columbia apparently is still going strong in Missouri and is proving a very satisfactory new variety. Mr. B. M. King has made some new crosses involving the transfer of resistance to crown rust, stem rust, and smut to the Columbia type.

At Lexington, Ky., a varietal experiment in field plots including Fulghum, Franklin, Burt, Wayne, etc., was observed. In the uniform rust nursery at Lexington some of the new agronomic strains included in this nursery for the first time appeared to offer possibilities for Kentucky.

M. S. Kipps, of the Virginia Experiment Station, Blacksburg, is testing a number of winter and spring oat varieties and strains in nursery experiments. In his winter oat nursery the Fulghum (winter type) selections, furnished by this Division some years ago, were in excellent condition and appeared to be well adapted to the conditions at Blacksburg.

Mr. Stanton will leave June 28 on his annual tour of the oat-growing States of the West. His itinerary will include stops in Ohio, Indiana, Illinois, Nebraska, Iowa, Wisconsin, Minnesota, South Dakota, North Dakota, Montana, Idaho, Washington, Utah, and Wyoming. He will inspect cooperative and other experiments with oats and study oat varieties. He will also confer with officials of agricultural experiment stations in the States where cooperative experiments are being conducted.

Dr. V. F. Tapke left June 24 for Ithaca, N. Y., to take notes on cooperative barley smut experiments.

RECENT PUBLICATIONS

Elliott, Charlotte. Bacterial Wilt of Sweet Corn in Mexico. (Phytopath. Note) Phytopathology 28(6): 443-444. June 1938.

Rodenhiser, H. A., and Quisenberry, K. S. Bunt Reaction of Some Varieties of Hard Red Winter Wheat. Jour. Amer. Soc. Agron. 30(6): 484-492. June 1938. (Cooperative investigations of the Division of Cereal Crops and Diseases and the agricultural experiment stations of Texas, Oklahoma, Kansas, Colorado, Nebraska, Minnesota, Montana, Utah, and West Virginia.)

Vogel, O. A., Hermann, Wilford, and Naffziger, Loy M. Two Improved Nursery Threshers. (Note) Jour. Amer. Soc. Agron. 30(6): 537-542, figs. 1-4. June 1938. (Joint contribution from the Division of Cereal Crops and Diseases, the Division of Agronomy of the State College of Washington, and the Pacific Northwest Soil Experiment Station.)

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

LOUISIANA

RICE EXPERIMENT STATION, CROWLEY (Rice Breeding, N. E. Jodon)
(June 18)

Dry conditions in the rice section continued until the 9th when it rained southwest of Crowley and around Lake Charles. On the 12th and 13th, 1.32 inches of precipitation occurred at the Station, but this rain did not extend much north of Crowley. Another 0.26 inch fell yesterday.

The rice nursery is in good condition and growing satisfactorily except that poor stands were obtained in places. Yield tests were seeded April 12 to 16, inclusive, and the first seedings had time to sprout in readiness for emergence before the 18th when a 2-inch rain fell. Water standing on shallow depressions followed by baking and coupled with cool weather prevented seedling emergence in spots. The uniform yield tests are in good condition, but some of the preliminary tests are so spotted that it will not be possible to obtain satisfactory yield data. Water was applied in the hope of bringing the seedlings through the crust, but with very little effect. Some of the F_2 material is also showing poor stands, owing to seeding in extremely dry soil in May. A few F_1 plants were lost after being transferred to the field from the laboratory. This appeared to be due to strong winds that occurred immediately after they were set out.

ARKANSAS

RICE BRANCH STATION, STUTTGART (Rice Production and Improvement, C. R. Adair) (June 18)

The grain yields of the winter oat varieties in field plots are given in the accompanying table. The yields were low this year, being only about 50 percent of normal. The low yields were caused partly by drowning during the winter and early spring and partly by a severe epidemic of crown rust. These results are about typical of the yields obtained on farm fields in this territory this year.

The five leading varieties are all red oats. These results again demonstrate that common oats are not adapted to this territory because of the likelihood of the occurrence of crown rust. During four of the past eight years crown rust has been so severe that the common oats have yielded little or no grain. Red oats are grown almost exclusively in this territory. However, it would be better if the farmers would pay more attention to the variety or strain of red oats that they sow. Every year quite an acreage of unselected Red Rustproof and Appler oats are grown which are definitely inferior to such varieties as C. I. 2462 and C. I. 2150.

Variety	C. I. No.	Yield per acre (bu.)
Hasting Hundred Bushel	2462	32.0
Ferguson No. 922	2150	28.9
Alber	2766	26.5
Nortex	2382	25.8
Red Rustproof (Tex. 1415-9)(518-3)	- -	25.5
Coker 33-50	3167	24.5
Red Rustproof	512	24.1
Ferguson No. 71	844	22.7
Fulgrain	3253	21.3
Appler	1815	21.0
Fulghum	708	20.0
Kocourek (local)	----	18.9
Coker 33-47	3176	18.3
Fulghum (winter type)	2500	15.5
Coker 32-1	3026	13.5
Coker Norton Strain No. 3	2909	10.3
Fulghum (winter type)	2499	8.7
Arkansas No. 267	----	4.5
Custis	2041	2.5
Lee	2042	2.1
Arkansas No. 12	----	2.1
Arkansas No. 1	----	1.1
Winter Turf (541-4)	3297	0.0

INDIANA

PURDUE UNIVERSITY AGRICULTURAL EXPERIMENT STATION, LA FAYETTE (Leaf Rusts, R. M. Caldwell) (June 22)

The season has been almost ideal for development of the cereal crops. It has likewise favored the development of most of the diseases of the small grain crops. The spring opened with little or no overwintering leaf rust to be found. Because of favorable weather in the southern half of Indiana, leaf rust developed rapidly, reaching 100 percent on susceptible varieties which it completely defoliated. In the northern half of the State leaf rust development was later in relation to the growth stages of the host and, while abundant, will no doubt cause less damage.

Stem rust developed earlier than usual and was widely and uniformly distributed, indicating a general aerial introduction of inoculum. In the areas observed by the writer no appreciable damage is predicted because of the early development of the crop. In the south-western area of the State Dr. B. B. Bayles reported stem rust "severe enough to do some damage," having become fairly severe on the peduncles about 10 days before maturity. It is too early to forecast stem rust damage in the northern third of the State.

Crown rust of oats has developed in epidemic proportions on winter and spring oats in the southern portions of the State.

The most severe leaf rust in our experience developed in the wheat disease-resistance-breeding nursery, which was artificially inoculated with 16 races of Puccinia rubigo-vera tritici. Susceptible varieties were defoliated before reaching the "milk" stage of kernel development. Some previously highly resistant strains of Fultz were moderately susceptible to one or more of these races. Hybrids between these Fultz strains and susceptible varieties have given some near immune progenies, however. Hope x Hussar hybrid selections and their progenies have been immune this season.

The study of the effect of leaf rust on six varieties has been unusually successful because of severe rust and excellent control by sulphur dusting. Twelve dustings have been necessary to control the disease.

Stem rust has reached 75 to 90 percent severity in the stem-rust-resistance breeding nursery consisting of 2,000 hybrid selections. Numerous lines possess the resistance or near immunity of Hope x Hussar selections used as the resistant parent. Many are also resistant to a composite of Indiana collections of bunt.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Grain Sorghum and Broomcorn, J. B. Sieglinger) (June 16)

Sorghum and broomcorn planting is progressing on schedule. Good stands of broomcorn were obtained from the first date of seeding. The grain sorghum date-varietal experiment planted June 8 emerged to good stands except for two of 21 varieties; Dwarf hegari and Standard kafir did not germinate too well because the seed was not fully mature when harvested lastfall.

The soil is in good condition for sorghum planting. Wheat harvest is under way and considerable hail damage has been reported from surrounding areas.

The maximum temperature for the first half of June was 96° on the 6th and the minimum 57° on the 7th. The precipitation for the same period was 0.81 inch in 6 measurable showers.

KANSAS

AGRICULTURAL EXPERIMENT STATION, MANHATTAN (Wheat Leaf Rust, C. O. Johnston) (June 8)

Weather conditions during the latter part of May and the first week in June have been fairly favorable for the development of winter wheat, except for too much rain in certain parts of the State. In the heavy wheat-producing area of south-central Kansas, winter wheat has deteriorated very rapidly during the past month. The deterioration is due to a combination of spring frost damage, extremely heavy leaf-rust infection, and too much wet weather during the latter part of the growing season. Many fields have slumped and now are ripening with an unnatural color. Combines have started in some of these fields and yields are proving to be very disappointing. Grain is poor in color and test weight is very low.

Leaf-rust infection has been very heavy in all parts of Kansas since about the middle of April. In many localities infection is so heavy that farmers concede that considerable damage has been done. It is very unusual for farmers to concede any damage from leaf rust. Stem rust infection has been present in the State since the early part of May but has failed to increase rapidly and is still an unimportant factor in the 1938 wheat crop in Kansas. Some fields of soft red winter wheat in the northeastern part are infected heavily enough for considerable damage to result. Hard red winter wheats still show only traces of infection in most parts of the State.

Artificial inoculations with stem rust in the rust nursery at Manhattan were started on May 13, and only in the last two days has infection become heavy enough to insure that reliable differences in resistance could be observed. The failure of stem rust to develop rapidly undoubtedly is due to low night temperatures. The average temperature for May at Manhattan was slightly above normal, but the minimum temperatures were below normal. These undoubtedly were governing factors.

Rainfall was abundant and well distributed throughout the State and infection was well enough distributed for uniformly heavy infections. It seems therefore that temperature was the limiting factor in 1938.

Two sets of leaf rust readings have been made in the rust nursery. Early-season readings were obtained on May 24 and late-season readings were completed today. Stem rust readings will not be ready for another week. Winter wheat in the rust nursery is still green with the exception of early selections which are now beginning to turn yellow. A great deal of leaf necrosis has been observed this year. This seems to have been due to a combination of heavy leaf rust infection and too much wet weather. There also is an unusually large amount of "false black chaff" in all Hope hybrids. This undesirable character is showing up this year on most of the heads and stems of hybrid lines containing even a small portion of Hope parentage. Considerable black chaff disease is being reported from the south-central part of the State. There also is an unusually large amount of glume blotch and basal glume rot. A combination of unfavorable growing conditions and many fungus and bacterial diseases is certain to result in the Kansas winter wheat crop being much smaller than the 193,000,000 bushels estimated in May.

(June 9)

Considerable stem rust has appeared in the western half of Kansas during the last two or three days. Considerable wheat in this area is still green enough to be rather seriously injured. Farmers and grain men are expressing some concern about this situation.

(June 17)

Deterioration of the winter wheat crop in Kansas continues to be reported as the season advances. Harvest is under way in southern counties and yields are proving to be very disappointing. Many fields are making only 5 to 8 bushels per acre and the grain is poor in quality. In addition to damage from frost, leaf rust, and excess moisture stem rust now is becoming serious in the western half of the State. Heavy stem rust infection also has been reported on soft wheats in northeastern Kansas, but such infections usually are local. It is a very unusual condition to have heavier infections of stem rust of wheat in western Kansas than in the heavy rainfall belt of the eastern counties.

Oats which gave promise of producing a bumper crop in nearly all parts of the State a few weeks ago now are heavily infected with crown rust. Recent severe storms have caused much lodging, and a combination of crown rust and lodging is certain to seriously reduce yields. Stem rust now is beginning to develop in many fields of oats and may be serious in about 10 days.

The 1938 winter wheat crop in Kansas and Oklahoma has been subjected to more unfavorable conditions than the writer can remember ever having seen in a single season. Warm weather during February and March resulted in too much early-season top growth. Severe freezes in April caused serious damage, some of which was not apparent until the crop neared maturity. Extremely heavy leaf rust infection further weakened the wheat plants throughout the entire Plains area. All these conditions were followed by very heavy rains in May and June, resulting in "wet feet" in general and actual drowning out of the plants in large spots. In addition to these afflictions considerable damage is being caused by black chaff, glume blotch, and basal glume rot in southern Kansas, and an unusually large amount of scab and anthracnose has been observed in eastern counties. Bunt is more prevalent than usual and apparently is increasing in eastern counties. Loose smut is much more prevalent than usual and infections are the heaviest ever observed in Kansas. Many fields have 5 to 10 percent of the heads smutted.

Although the recent official estimate placed the 1938 wheat crop at 193,000,000 bushels it is generally conceded that the figure is much too high. Recent deterioration due to a combination of spring freeze, diseases, and unfavorable weather conditions have caused many private crop estimators to lower their figures to around 150,000,000 bushels.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (June 16)

Climatic conditions in general continued favorable for crop development during the first half of June although rainfall was deficient. Generally cool temperatures prevailed with much cloudiness and at least a trace of precipitation on 8 of the 15 days. The total precipitation during this period was only 0.24 inch. The maximum temperature was 92° on the 13th and the minimum 38° on the 7th. Crops are beginning to show some slight effects of drought and more rainfall will soon be needed to maintain continued normal development and insure good crop production.

Heads are already showing on early varieties of wheat, oats, and barley. Flax ranges in height from about 4 inches for the early seedings to about 1 inch for the latest seedings.

Cutworms are doing some damage to flax stands but are not nearly so plentiful as in 1937 at this time. Grasshoppers are present in considerable numbers, a few already with wings, but apparently are being kept under control by poisoning.

Leaf rust has increased and spread gradually but has shown no marked development in proportion to leaf growth. The infection is not conspicuous on the upper leaves of the plants although many lower leaves show heavy infection. No stem rust on wheat nor rust of any kind on oats or barley have been noted so far, although a careful search was made today on some of the most susceptible varieties.

WASHINGTON

AGRICULTURAL EXPERIMENT STATION, PULLMAN (Wheat Improvement, O. A. Vogel) (June 15)

The fall-sown varietal nurseries are in good condition. Some of the early winter barleys probably will be ripe within the next 10 days. The winter wheats are around 4 feet tall and if the weather continues favorable, may grow six inches taller. The earliest varieties headed two weeks ago and the latest ones headed yesterday. The winter ryes are from 5.5 to 6.5 feet tall and probably will be ripe within the next two weeks.

Some of the new short-strawed winter wheat hybrids were very severely damaged by stripe rust. However, the majority of the hybrids and the more important commercial varieties were affected but little or not at all.

The crops in the Palouse region in general look good but are beginning to show the need of rain or continued cool weather. In the drier areas of this State the winter wheat can be greatly benefited by a rain within the next few days.

The spring wheat nurseries are in good condition. The medium early varieties are just heading.

C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
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BUREAU OF PLANT INDUSTRY

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Personnel (June 26 - July 10) and Field Station (June 16 - 30)

PERSONNEL ITEMS

Dr. B. B. Bayles returned to Washington from the Corn Belt States on July 5 and left the evening of the same day on a 10-day trip in New York, Pennsylvania, New Jersey, and Delaware for the purpose of looking over cooperative wheat experiments and to study varieties and hybrids in breeding nurseries.

Mr. W. J. Sando will leave Washington July 13 to study wheat breeding problems in Idaho, Washington, Utah, Nebraska, Iowa, Missouri, Kansas Montana, and Wyoming. He will harvest wheat genetic material and collect wheat relatives. Mr. Sando will be away from Washington until about September 5.

Mr. D. E. Stephens, senior agronomist in the Division of Cereal Crops and Diseases, and superintendent of the Sherman Branch Experiment Station at Moro, Oreg., since 1912, has been appointed principal agronomist in the Soil Conservation Service effective July 1, 1938. His headquarters are being transferred to Washington, D. C., where he will act as a coordinator between the Soil Conservation Service and the Bureau of Plant Industry. Mr. Stephens received his first appointment in the Division of Cereal Crops and Diseases on July 1, 1908, and has served continuously with the Division since that time. During his period of service he has made most important contributions, both in the selection, increase and distribution of new cereal varieties and in the development of sound information on tillage and rotation practice. He has acquired a background and breadth of viewpoint making him unusually well qualified for the new assignment. Fortunately, his new duties will maintain contacts with the Cereal Division and its personnel.

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

VIRGINIA

ARLINGTON EXPERIMENT FARM, ROSSLYN (Small Grain Agronomy, J. W. Taylor) (June 18)

Fall-sown barley ripened about 5 days earlier than average; wheat and rye are about normal in maturity. Barley suffered little if any winter-killing and yields should be satisfactory. Fall-sown oats showed no injury at Arlington but at Kearneysville, W. Va. they were 85 percent killed.

The wet weather at seeding time caused poor stands in much of the fall-sown wheat at Arlington. This condition is not general in Virginia or in neighboring States, however. Leaf rust infection was 100 percent at the late milk stage in commercial varieties, both at Arlington and in the farmers' fields examined. Stem rust was present in all fields, and in the late-sown fields yield is certain to be reduced from the combined rust infection. Mildew on wheat was the heaviest ever observed and Septoria is common.

ARKANSAS

RICE BRANCH STATION, STUTTGART (Rice Production and Improvement, C. R. Adair) (June 30)

The writer made a trip on June 22 to the northern end of the rice territory. Not much of the rice crop on new land was visited except that around McCrory. The crop on old land in the Fisher-Weiner territory did not look so well as usual. The stands were rather poor and there was considerable grass. Two of the outlying rice varietal experiments were visited, namely, in Monroe County and in Poinsett County, and grass was bad in both. The rice in the Monroe County test, which is on second year land, was growing vigorously, however. The land in the Poinsett County test has been in rice for a good many years and there the rice is making rather poor growth.

The writer also made a trip to the southern and eastern ends of Arkansas County on June 28. Another of the outlying rice varietal experiments, located about six miles south of Gillett, was visited that day. Here the rice had been injured somewhat by root maggots, but the land was being drained.

The rice crop around Stuttgart and DeWitt is about normal at this time. Some injury of the type thought to be due to high alkalinity of the soil has been reported. This condition is quite widely distributed over the old land on the prairie but the total acreage affected is probably relatively small. There was some difficulty in getting good stands of rice this spring and many fields were reseeded. There were more poor stands and reseeding on Little Prairie (Tichnor) than at any other place in this section. Probably eight or ten big fields along the writer's route in that community had been reseeded. Rice looked fairly well in the eastern part of the County. Around St. Charles, however, there was a good deal of barnyard grass.

It appears at this time that the rice crop may be a little below normal.

MINNESOTA

AGRICULTURAL EXPERIMENT STATION, UNIVERSITY FARM, ST. PAUL (Wheat Breeding, E. R. Ausemus) (July 6)

Weather conditions in June have been fairly favorable for cereal crops, except for too much rain in certain parts of the State. All cereal crops have made a luxuriant growth and are lodging badly in many areas. Winter wheat is in the milk stage and spring wheat is almost as far along in maturity.

Leaf rust infection is heavy on both winter and spring wheats. Stem rust infection has been present in the State since the early part of June. The Minhardi border rows in our winter wheat nursery were badly rusted with stem rust at the Waseca branch station, while Minturki, the commercially grown variety, showed only a trace of stem rust.

Corn is making a good growth.

The rainfall in June was 4.22 inches, as compared with a normal of 2.96 inches.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Grain Sorghun and Broomcorn, J. B. Sieglinger) (July 1)

Two heavy rains, six days apart, delayed wheat harvest and sorghun planting and also washed out some planted sorghums and put the soil into a condition susceptible to blowing.

Wheat harvest on the Station is nearly completed and a little sorghun planting of quick maturing varieties remains to be done.

The main work on the sorghun and broomcorn project is thinning and cultivating.

The maximun temperature for the last half of June was 97° on the 23d, and the minimun, 60° on the 27th. The precipitation for the same period was 3.74 inches, making a total of 4.55 inches for June 1938.

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (July 1)

The 1938 winter wheat crop on the Woodward Field Station and in northwestern Oklahoma was surprisingly good considering that it went through a number of critical periods each of which threatened to ruin it. A severe wind and dust storm was experienced in January. The worst late blizzard in the history of Oklahoma occurred in April. Leaf rust developed unusually early. Fortunately, cool and moderately windy weather counteracted the frequent showers that fell. Hail accompanied five of the showers. Sten rust was noted in northwestern Oklahoma about the middle of May (May 19 on the Station) but did not develop enough to be of consequence. Over 18 inches of rain fell between January 1 and harvest, more than was received during the whole crop years of 1936 and 1937. As a result growth was very rank and the consequent heavy lodging provided excellent opportunity for discarding weak-strawed strains. Thirteen Blackhull x Hard Federation strains that have been outstanding for yield during the past three years are still standing as straight as ramrods 3 weeks after harvest, while nursery material in adjacent rows in all directions is lodging 15 to 100 percent.

In spite of the unusually heavy rainfall right up to harvest there was a surprising amount of premature ripening and delayed ripening of early varieties. Some varieties heading on April 27 ripened on the same day as varieties that headed on May 17. Late and moderately late varieties ripened almost on the same day. Premature ripening was perhaps partly responsible for 17 of the 19 varieties on cropped land outyielding those on fallow. The following average agronomic yield data were obtained from quadruplicated 1/47th-acre plots at the Woodward Field Station in 1937-1938. Test weights have not yet been taken.

Variety	C. I. No.	Date First headed	Date Ripe	Height	Leaf rust	Lodging	Shattering	Av. yield (Bu. per acre)
			June	Inches	Pct.	Pct.	Pct.	
Kawvale x Tenmarq	11669	May 11	14	44	16	20	0	56.2
Tenmarq x Nebr. 28	11847	May 11	15	49	43	4	0	45.7
Kawvale	8180	May 13	14	48	15	10	5	45.3
Quivira	8886	May 8	13	45	24	20	0	44.2
Oro x Tenmarq	11673	May 10	14	45	23	20	0	43.9
Chiefkan	11754	May 11	14	48	35	tr	0	43.2
Turkey selection	10016	May 11	14	44	55	16	0	42.8
Tenmarq	6936	May 12	13	47	48	8	0	41.3
Danne selection H.59-C	----	May 11	14	45	70	30	0	40.5
Kanred	5146	May 14	15	47	75	20	0	36.4
Kharkof	1442	May 16	16	47	76	1	0	36.2
Cheyenne	8885	May 14	15	46	74	tr	0	35.6
Oro	8220	May 15	15	48	71	tr	0	35.5
Sibley 62	11523	May 14	15	47	68	tr	0	35.1
Turkey (local)	----	May 16	15	47	70	tr	0	34.1
Denton	8265	May 14	16	49	19	9	3	33.1
Fulcaster	6471	May 15	15	50	50	tr	10	31.4
Blackhull	6251	May 13	14	47	71	48	0	28.5
Early Blackhull	8856	April 26	7	39	64	40	0	27.2

Threshing of nursery material was started on June 24 and will continue for about two weeks. Yields are promising, although protein percentages will probably be low. Yellow berry kernels are common.

Oats and barley varieties made rank growth in 1938 and considerable lodging resulted. The varieties have not been threshed but field observations would indicate high yields.

NEBRASKA

AGRICULTURAL EXPERIMENT STATION, LINCOLN (Wheat Improvement, K. S. Quisenberry) (June 30)

At Lincoln the June weather was such as to delay the maturity of winter wheat. Although some varieties started heading earlier than in 1937, harvest began on June 27, or 10 days later than in 1937. As reported before, leaf rust was found rather early and the epidemic became very severe, which in the case of some varieties prevented normal heading. The epidemic was the most severe that the writer has ever seen. Because of continued surface moisture straw growth became very heavy and when the moisture supply was exhausted about June 15 considerable burning was noted. It is doubtful if very much 60-pound wheat will be harvested in the nursery. At the present time stem rust is becoming very heavy on the later varieties. The first plots of winter wheat will be harvested today.

The oat and barley nurseries made very heavy growth and looked well until about June 16, when some beating rains caused considerable straw breaking and lodging. Very distinct varietal differences were observed. The first oat and barley nursery rows were harvested on June 23 and at present nearly all of the barley nursery and more than 50 percent of the oat nursery is harvested. The plots of the early varieties of oats and barley were cut on June 29.

A trip was made to North Platte on June 24 to take notes on the wheat. Straw growth was very heavy in all cases and considerable burning was in evidence owing to lack of moisture. It is likely that yields will not be high and test weights probably will be low. The epidemic of bunt in the nursery grown under irrigation was satisfactory and some valuable data were obtained.

In eastern Nebraska leaf rust has apparently done considerable damage, particularly on the late fields. At present stem rust is being reported from the southeast corner of the State and it is known to be rather heavy in the vicinity of York and Grand Island. As yet few reports have been received indicating that there is very much straw breaking as is so common in Kansas. In a small area around Lincoln drought has caused the premature ripening of some fields of winter wheat.

Mr. J. A. Clark visited the Station on June 22 and 23 and Mr. C. O. Johnston and Dr. D. B. Creager were official visitors on June 27.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (July 2)

The crop prospects in this area were greatly improved by rain, amounting to 2.87 inches, during the last half of June. Most of this occurred after the 21st. Over two inches of rain on the 22d, 23d, and 24th came just in time to avert serious damage to small grains, on which the leaves were already firing severely. The precipitation for the first six months of the year was 8.74 inches, which is about half an inch more than the average for the past 24 years.

Wheat, oat, and barley varieties in plots and nursery rows are practically all headed. First blooms appeared on the earliest flax varieties on the 22d, but only a few varieties are now in full bloom.

Stem rust was first noted on wheat on the morning of June 23. Pustules appeared simultaneously and generally distributed on all susceptible varieties of wheat and on all barley. Leaf rust has shown a steady increase on all susceptible varieties of wheat. Stem rust and crown rust were found on oats, and leaf rust on rye on the 27th. Grasshoppers are doing some damage to the leaves of small grains.

Mr. Gilbert L. Wood, agent, from College Station, Texas, arrived June 30 and reported for duty July 1 to be employed on the Cereal Project at Mandan.

Visitors to the Station included Dr. Ralph U. Cotter, Mr. J. Allen Clark, and Dr. L. R. Waldron.

The maximum temperature was 96° and the minimum, 48°.

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (July 1)

Moisture conditions have been favorable since the middle of May and cereal crops are in better condition than in any year since 1932. Early varieties of wheat, oats, and barley are headed and late varieties are heading. Leaf rust on wheat was first observed June 21 and stem rust June 23. Probably a trace was present before that time. Favored by moisture conditions the prevalence of both forms of rust has increased considerably since first observed.

Grasshoppers in this vicinity have been held in check by repeated poisoning. There is still a possibility of considerable damage from hoppers flying in from the region near the South Dakota line, where crops have been seriously injured by hoppers and drought.

Dr. R. U. Cotter was an official visitor at the Substation yesterday. Other visitors yesterday included a group of about 30 Stark County farmers, accompanied by the County Agent, Ralph Dietrich. They showed considerable interest in cereal varieties, diseases, and crop experiments.

The rainfall for June, including a shower last night, was 5.02 inches and the total for 1938 to date is 10.60. Both figures are approximately 2 inches above normal for Dickinson. Cool weather has prevailed during most of June.

AGRICULTURAL EXPERIMENT STATION, STATE COLLEGE STATION, FARGO (Wheat Improvement, G. S. Smith) (July 2)

The total precipitation for June at Fargo was only 1.04 inches, whereas the normal is 4.05. Fortunately, temperatures were not above normal so the crop is still in fair condition but the ground is cracking badly and many wheat plots in the rotation studies are suffering. Heading of the grain has come on very rapidly. Tillering was very heavy but many heads will not fill without good rains very soon.

Stem rust inoculum has been very abundant as judged by the pustules developing on susceptible material. However, at Fargo it has not developed very markedly because of the drought. Most of the rest of North Dakota and adjacent Minnesota has been much better favored by rains and it may be expected that considerable damage from stem rust will result. Leaf rust is unusually heavy and certain varieties are showing considerable injury.

At Langdon, June rainfall and temperatures also were below normal but not quite so unfavorable as at Fargo and the nursery and variety plots are in very good shape.

MONTANA

AGRICULTURAL EXPERIMENT STATION, BOZEMAN (Wheat Improvement, R. H. Bamberg) (July 1)

During most of June the weather was mostly cool and cloudy with frequent showers. In the last two weeks there was only one day without precipitation although the total for the month has been only 1.82 inches. Spring grains have begun to joint and are from 10 to 16 inches high. Winter wheats are in full flower. Most varieties are 36 to 48 inches tall and some have lodged badly during the recent wet weather.

At Moccasin more than 1 1/2 inches of rain in the last two weeks greatly benefited winter wheats, which had begun to fire. Spring grains are growing rapidly, barley showing the first heads a few days ago.

OREGON

PENDLETON FIELD STATION, PENDLETON (Cereal Agronomy, J. F. Martin) (July 1)

Prospects for a good crop of winter wheat in the vicinity of the Station are excellent, but some fields in the drier areas are in poor condition. Yields of wheat in Umatilla County will vary from 5 to more than 50 bushels per acre. Harvesting of winter wheat will be general in about 2 weeks, and some fields are ready to cut now. Spring grains still are very green, and much depends on the weather during the next 2 or 3 weeks. A few days of hot winds probably would ripen spring crops prematurely.

There was no precipitation after May 18 until June 16, which was too late for maximum benefit on shallow soil. Spring crops suffered more than winter wheat under such conditions. On the deeper soils of the vicinity and in areas of higher rainfall, prospects for a good crop of spring grain remain satisfactory.

A hail storm on June 17, during which 0.5 inch of moisture fell in one-half hour, caused considerable lodging in spring barley and some in winter wheat. All but the very weak-strawed varieties have straightened up, however. The total precipitation for June was 1.55 inches, which is about average for the period. Warm weather prevailed during most of the month, the maximum temperature being 92° F. on June 4.

UTAH

AGRICULTURAL EXPERIMENT STATION, LOGAN (Cereal Agronomy, R. W. Woodward) (July 2)

Growing conditions for crops in general have been most favorable. At this time there is considerable lodging of cereals owing to the occurrence of heavy showers almost daily during the past week. Winter wheat promises to give bumper yields throughout the State. Bunt infection is not so serious as in 1937, although fields of susceptible varieties show considerable percentages. Small bunt nurseries within commercial fields of a resistant variety show upwards of 50 percent of infection of low smut. Experiments this year indicate rather definitely that smut lives over in the soil at least one year, which may partly account for the same fields having heavy infection of bunt year after year.

Spring grown cereals have generally headed and, like winter wheat, have made prolific growth. Lodging is especially severe in the barley nursery. Loose smut of barley is more abundant than at any time since barley experiments began at this Station. No rust is visible as yet in spite of the cloudy wet month of June. Some mildew can be found in the late seedings of wheat.

The precipitation for June was 1.17 inches and the evaporation 4.20 inches. The maximum temperature was 94°, the minimum, 32°, and the mean, 64.3°.

ARIZONA

AGRICULTURAL EXPERIMENT STATION, TUCSON (Cereal Agronomy, A. T. Bartel) (July 3)

Harvesting and threshing of all the small grains at Tucson and Mesa have been completed. The average yield of barley varieties grown in 3 1/36th-acre plots at the Salt River Valley Experiment Station, Mesa, was as follows:

Variety	C. I. No.	Av. yield (Bu. per acre)
Atlas x Vaughn (Ariz. 269)	----	93.8
Atlas x Vaughn (Ariz. 257)	----	90.0
Scarab	995	83.3
Sacramento	4108	81.0
Vaughn	1367	78.8
Union Beardless	5976	67.5
Trebi	936	66.8
Common Six Row	4625	61.5

The mean maximum temperature for June was 98.6° and the mean minimum, 65.1°; the maximum temperature was 106° and the minimum, 56°. The precipitation was 2.07 inches. The 62-year average precipitation for June is 0.25 inch.

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CEREAL COURIER

Official Messenger of the Division of Cereal Crops and Diseases
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Personnel (July 11 - 25) and Field Station (July 1 - 15)

PERSONNEL ITEMS

Dr. Charlotte Elliott recently returned to Washington after brief trips to New York and Pennsylvania to obtain data on bacterial wilt of sweet corn in experimental plantings.

Dr. H. B. Humphrey left Washington on July 24 to inspect uniform rust nurseries and visit experiment stations in Ohio, Michigan, Minnesota, South Dakota, North Dakota, Kansas, and Iowa.

Dr. A. G. Johnson spent about a week in Georgia inspecting corn for bacterial leaf blight and visiting agricultural experiment stations.

Mr. L. W. Kephart returned from a 4-day trip to Maryland, Pennsylvania, New Jersey, and Delaware, where he inspected bindweed-control experiments and infested fields, and will leave soon on a six-week trip to Ohio, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Nebraska, South Dakota, North Dakota, Montana, Idaho, Washington, Oregon, California, Nevada, Utah, Colorado, and Kansas, to observe bindweed-control experiments.

Dr. A. E. Longley will be absent from Washington from about July 23 to August 10 collecting cytological material, making pollinations, and inspecting teosinte and maize plantings in South Carolina, Georgia, and Florida.

Mr. Fred C. Meier, of the United States Department of Agriculture Extension Service, was transferred temporarily, effective July 10, to the position of Principal Pathologist in the Division of Cereal Crops and Diseases to investigate the aerial dissemination of pollen grains and spores of fungi and bacteria causing plant disease. This is a Bankhead-Jones special research project in cooperation with the National Research Council and cooperating agencies on the Committee on Aerobiology. Mr. Meier left recently on a one-month trip by air to Texas, California, Philippine Islands, Hong Kong, and intermediate points to collect air-borne organisms and arrange for future collections.

RECENT PUBLICATIONS

R. W. Leukel, J. A. Faris, V. F. Tapke, and H. A. Rodenhiser. Wheat Smuts and Their Control. U. S. Dept. Agr. Farmers' Bull. 1711 rev., 18 pp., 10 figs. February 1938.

A. L. Smith, P. E. Hoppe, and J. R. Holbert. Development of a Differential Inoculation Technique for Diplodia Stalk Rot of Corn. Phytopathology 28(7): 497-504, figs. 1-4. July 1938. (Cooperative investigations of the Division of Cereal Crops and Diseases, the Wisconsin Agricultural Experiment Station, and Funk Bros. Seed Co.)

C. S. Holton. A Simple Method of Inoculating Wheat Seedlings with Paired Monosporidial Lines of Tilletia tritici and T. levis. (Phytopath. Note) Phytopathology 28(7): 518-520, fig. 1. July 1938. (Cooperative investigations of the Division of Cereal Crops and Diseases and the Washington and Idaho Agricultural Experiment Stations.)

F. L. Timmons. Methods of Eradicating Bindweed. Kans. State Bd. Agr. Rept. 57: 102-112. 1938. (Cooperative investigations of the Division of Cereal Crops and Diseases and the Kansas Agricultural Experiment Station, at the Fort Hays Experiment Station, Hays, Kans.)

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

LOUISIANA

RICE EXPERIMENT STATION, CROWLEY (Rice Agronomy, J. M. Jenkins) (July 7)

Dry weather prevailed until the heavy rain on June 12. Following that, rains were rather frequent and heavy, giving a total of 5.17 inches for the month. While the precipitation for June was about an inch more than the 28-year average, it was not sufficiently general over the rice area to supply sufficient water to entirely relieve the shortage for irrigation purposes. If, however, the precipitation in July is normal, there will be no danger of enough salt water entering the streams that furnish water for irrigation to be injurious to rice.

Temperatures in June averaged about 2° below those in June 1937. The maximum was 93°, the average maximum 89°, the minimum 64°, the average minimum 72°, and the average mean 80°.

Operations on the Station progressed more satisfactorily than usual for this time of year. Early maturing rices in the March seedings in the date-of-seeding experiment are heading.

Good stands were obtained in the fertilizer experiments, and the effect of several fertilizer combinations on the growth of the young rice plants is very noticeable.

On the whole the commercial rice fields are exceptionally good and free from certain weeds. Some fields, however, are badly infested with barnyard grass. Many fields of early rices started to head about the middle of June. These fields will be mature about the third week in July.

RICE EXPERIMENT STATION, CROWLEY (Rice Breeding, N. E. Jodon) (July 16)

Early maturing rice varieties sown in the nursery about the middle of April are now beginning to head. The usual amount of white tip is present, but Helminthosporium has not developed to any marked degree. The commercial rice crop at the present time is reported, in general, to be in unusually good condition. Harvesting of Early Prolific sown in March in this locality will begin within the next few days. Rainfall to date this month totals 2.79 inches. The highest temperature was 96°.

MINNESOTA

AGRICULTURAL EXPERIMENT STATION, UNIVERSITY FARM, ST. PAUL (Wheat Breeding, E. R. Ausemus) (July 18)

Small grains continued their favorable growth during the first half of July. Excessive moisture and severe winds have caused lodging in many parts of the State. Winter wheat and rye are now being harvested in southern Minnesota and Thatcher spring wheat will be ready for harvest within a few days. Susceptible varieties at the Waseca Experiment Station were very badly rusted, but Minturki only had a light infection of stem rust which should not cause serious damage to this variety. A number of the new crosses of Hope crossed with Minturki and then backcrossed to Minturki are very resistant to both leaf and stem rust at St. Paul and Waseca this year.

In a recent trip with Mr. J. A. Clark from Morris to southwestern Minnesota and to Waseca, it was observed that Thatcher was seeded on about 85 percent of the wheat acreage. An occasional pustule of stem rust was found in fields of Thatcher. The newer hybrid varieties resistant to stem rust showed very little sten rust at Morris and Waseca, where Ceres and Marquis were completely susceptible. Corn was excellent and many fields were beginning to tassel.

Rainfall during the first half of July was 2.77 inches.

TEXAS

SUBSTATION NO. 4, BEAUMONT (Rice Production and Improvement, H. M. Beachell) (E. C. Tullis) (July 8)

Helminthosporium leaf spot in the leaf spot nursery at Texas Substation No. 4 has increased appreciably the last ten days. No Cercospora leaf spot has been found to date.

Commercial fields in the vicinity of Nome, Stowell, and China have only a slight amount of Helminthosporium leaf spot. Some early-sown rice below Stowell is beginning to head.

SUBSTATION NO. 6, DENTON (Wheat Improvement, I. M. Atkins) (July 9)

Weather conditions during June were, in general, favorable for crops. Showers, during the first part of the month, delayed threshing of small grains to some extent but did not damage the grain. Total precipitation for the month was 3.08 inches which is 0.29 inch above normal and brings the cumulative departure from normal since January 1 to +7.06 inches. Temperatures during the month were about average. The maximum temperature was 98° and the minimum 62°.

Small grain harvest was completed during the first ten days of June. Harvest of nursery plots was difficult because of severe lodging caused by rust damage and strong winds. Threshing of field plots has been completed with fall-sown oats yielding more than 100 bushels per acre in some instances. The quality of the fall oats was excellent but spring oats were light in test weight. Yields of wheat were low and quality for the most part poor, due to rust damage.

The writer spent the period June 23 to July 8 in the Texas Panhandle harvesting the wheat nursery and experimental plots at Amarillo and the cooperative tests on farms. Good yields were obtained in the Amarillo nursery for the first time in many years. Wheat, in general, is poor in the Texas Panhandle. The south part of the Panhandle suffered severe damage from freezing in April, followed by greenbug damage and more recently by excessive rain damage. Many fields were plowed up before harvest and those harvested yielded poorly and the quality was only fair. The north portions of the Panhandle

suffered throughout the winter from lack of moisture, followed by favorable spring rains and rather rank growth. The precipitation during May and June was not sufficient to mature the crop and yields were disappointing. Certain sections of the north Panhandle, where wheat emerged and survived the winter, reported good yields of fine quality grain.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Grain Sorghum and Broomcorn, J. B. Sieglinger) (July 16)

July brought typical summer weather with the first maximum of 100° for the year. Warm weather and moisture have caused both sorghums and weeds to grow rapidly. The late planting on July 9 emerged to better stands than in previous years as soil conditions were more favorable. Planting, thinning, and cultivating have been under way. Indications at present are favorable for sorghums and broomcorn.

Maximun temperature for the first half of July was 103° on the 12th and 13th. Minimum for the same period was 66° on the 7th and 8th. The precipitation was 1.01 inches.

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (July 16)

Nursery threshing started on June 24 but was interrupted on July 7 by a lightning bolt that knocked two men flat and a third to his knees and set the barn loft afire. The City Fire Department extinguished the fire.

Three large truck loads of nursery bundles, mostly F_4 to F_8 smut-resistant plant selections, could not be salvaged. Some head selections were lost. Eighty-seven rows of F_2 material (11 crosses) were lost and a few F_1 crosses. The winter and spring barley nursery material came through fairly intact, but 46 strains of spring oats were badly damaged. Only five strains were saved intact, though enough grain for reseeding was salvaged fron 11 additional strains.

All equipment was saved except a Columbia and a Planet Jr. planter.

Nursery threshing, except for head selections and a few other niscellaenous items, was completed on July 12.

KANSAS

FORT HAYS EXPERIMENT STATION, HAYS (Cereal Agronomy, A. F. Swanson) (July 18)

Small grain threshing has been completed and recleaning and weighing of the grain are in progress. In the winter wheat varietal test the yields will range from 16 to 42 bushels per acre. Several varieties were able to withstand the many hazards that threatened the crop throughout the growing season.

Yields of oats and barley above 50 bushels are expected in both the varietal and nursery tests. Hail and heavy rains during May and early June caused almost complete lodging in both crops, although individual lines showed rather marked resistance. Trojan was the most resistant to lodging in oats, and hybrid barleys from the Atlas x Vaughn cross were resistant to lodging and high in yields.

Almost no rain has fallen since June 20 and temperatures on a number of days in early July were above 100°. The row crops, which were planted in fields with good sub-soil moisture, are making good growth. Rain will soon be needed to bring these crops through, however.

COLORADO

AGRICULTURAL EXPERIMENT STATION, FORT COLLINS (Wheat Improvement, J. J. Curtis) (July 21)

The winter wheat harvest was begun on July 16. It should be completed by July 23. This wheat promises to make high yields. Only the very stiff-strawed strains are standing erect. Many are lodged 90 to 100 percent.

The spring wheat in just beginning to ripen. Stem rust is present in the susceptible varieties but no serious damage will occur. The spring wheat on the Agronomy Farm is badly lodged. Good yields will be obtained.

Spring wheat in the irrigated sections of northern Colorado is in good condition generally. No serious damage from stem rust is apparent, although a few fields where a very susceptible variety was planted may show some damage.

Mildew is prevalent in the spring wheat nursery. Some strains, sent to this Station by Mr. J. A. Clark, show considerable resistance to mildew.

The rainfall at Fort Collins for the first half of July was 0.55 inch.

At Akron, the harvesting of winter wheat, barley, oats, and spring wheat has been completed. All small grains ripened rapidly, due to dry, hot weather in late June and early July. Grain will be low in test weight.

The spring wheat promised to make good yields in early June, but dry, hot weather caused it to ripen prematurely and yields will be below normal. Stem rust was present but did little damage.

Winter wheat, barley, and oats promise to make normal yields but will be low in test weight.

A very hot, dry period at Akron was broken on July 13 when one inch of rain fell.

Total precipitation for the first 15 days of July was 1.23 inches. The maximum temperature was 101° on the 13th, and the minimum was 51° on the 8th.

NEBRASKA

AGRICULTURAL EXPERIMENT STATION, LINCOLN (Wheat Improvement, K. S. Quisenberry) (July 11)

Small grains ripened very rapidly during the first 10 days of July. Harvesting of winter wheat varietal plots was completed on July 4, but not before the straw of a number of varieties broke over very badly. This straw weakness was worst in Blackhull, Blackhull hybrids, Chiefkan, and some Turkey selections. All of the winter wheat nursery, except a few hybrid rows and head rows, is now harvested. A combination of leaf and stem rust and hot, dry weather ripened or killed the varieties in the nursery very quickly. Yields will probably be rather low, and quality will be poor.

The oat and barley varieties in plots were all cut by July 5. Grasshoppers caused considerable loss in some barley plots before harvest. In the nursery, most oat varieties had very weak straw and there was a great deal of lodging.

Spring wheat varieties in plots were harvested on July 7 and 9. One or two varieties were cut rather green because grasshoppers were causing considerable loss.

Mr. F. A. Coffman visited Lincoln on July 1, 2, and 5, and Dr. G. A. Wiebe was a visitor on July 6.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (July 16)

Crops have made rapid development during the first half of July. Reward wheat and several varieties of oats are practically ripe and the harvest will be in full swing next week.

Rusts have continued to develop on cereals. Leaf rust is heavy on susceptible varieties. Stem rust is heavy on Marquis, Reward, and Ceres wheats in the plots, and extremely heavy on the most susceptible varieties in the rust nursery and nursery borders. All other varieties in plots show great resistance to stem rust, as do most of the strains in the nursery. Some varieties, including Thatcher, have a little stem rust and others are entirely free. More crown rust and stem rust occurred on oats than for some years past. Rust has been noted on flax but is not prevalent even on the most susceptible varieties.

Flood waters from the Heart River, caused by heavy rainfall west of Mandan, covered lowlands in and around the city July 6 and 7, driving about 50 families from their homes and inundating a large part of the Soil Conservation tree nurseries. Garden crops were ruined and the water still standing in many places is providing a breeding place for hordes of mosquitoes. Grasshoppers have stripped many of the leaves from cereal crops and are still prevalent in damaging numbers.

The maximum temperature was 91°, and the minimum, 50°, and the precipitation 1.45 inches.

Among the visitors to the Station, many of whom came to see the rust on the wheat varieties, were Messrs. J. Allen Clark and A. C. Dillman.

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (July 16)

The weather in July has been comparatively cool, with rainfall on seven days. Most of the rain occurred during the first five days and totaled 2.42 inches in addition to 0.32 inch on June 30. The maximum temperature was 86° and the minimum, 43°.

Notes were taken on the heavy infection of leaf rust on wheat before grasshoppers stripped the leaves. There are a serious epidemic of stem rust on susceptible varieties of winter and spring wheat, a considerable infection on barley, and a small amount of crown rust on oats.

The most serious menace to cereal crops is the grasshoppers which are the most numerous the writer has seen during 36 years in the State. Field plots of oats and barley were cut green after 30 percent to 75 percent of the barley heads and about half of the oat spikelets had been removed. Wheat varieties are still green but some varieties, especially Canus, Reward, Reliance, and Renown, are being injured severely by the hoppers. The best varieties of barley in the nursery have been harvested while many others are too badly riddled to be cut. Oat varieties in the nursery will be cut Monday. A field of rye cut green this morning had approximately 600 to 800 grasshoppers on each shock at 5 p. m. These insects are milling about whenever the wind blows and are thinning out in some fields.

Mr. J. A. Clark visited the Substation today.

AGRICULTURAL EXPERIMENT STATION, STATE COLLEGE STATION, FARGO (Wheat Improvement, G. S. Smith) (July 18)

Rains were general in North Dakota the week end of the Fourth and were especially welcome at Langdon and Fargo where drought was becoming acute. Nearly 3.5 inches were recorded at Langdon and 1.4 inches at Fargo. The weather since has been dry and warm and more rain is badly needed.

Leaf rust has taken a significant toll on susceptible varieties such as Ceres, Marquis, and Thatcher. Stem rust has been held somewhat in check because of the drought, but test weights of susceptible varieties will probably be cut to 50 or 55 pounds or even more where occasional showers were received. The stem rust situation in the durum wheat is somewhat spotted. Some fields of Mindum in the hard dough stage near Grand Forks and Crookston carried heavy infection and certainly will be injured. Farther north into the durum territory some fields were very late and just fully headed, and, although some are now relatively free from rust, they have considerable time yet to go.

The yield nursery at Fargo is turning ripe rapidly. Distinct differences are apparent in leaf rust and stem rust resistance. Black chaff was most severe at Crookston and probably will develop at Langdon.

IDAHO

AGRICULTURAL EXPERIMENT STATION, MOSCOW (Stripe Rust, W. M. Bever) (July 13)

The most severe stripe rust (P. glumarum) infection in the writer's experience developed this year. Readings were made on 655 different grass species and strains included in the Soil Conservation grass nursery at Pullman, Wash. Many of the more susceptible strains were literally covered with this rust, and in many cases it is doubtful if they will even head. A few new susceptible grass species were added to the list published by Hungerford and Owens in 1923 (Jour. Agr. Res., Vol. 25, No. 9). In both the Pullman, Wash., and Moscow, Idaho experiment station wheat varietal nurseries, stripe rust was especially severe on susceptible varieties. Leaves on the susceptible varieties, such as Jones Fife, Federation, and Forty-fold, were completely killed early in the season. Some of the more susceptible barley varieties in the nursery were also heavily infected.

At Sandpoint, Idaho, leaf rust was more prevalent on wheat than either stripe or stem rust. On some of the more susceptible varieties a prevalence of 100 percent was noted; however, it was difficult to estimate the actual damage done by this rust. At Moscow in the bunt nursery, varieties such as Hybrid 128 and Martin showed 100 percent infection.

Stem rust was first noted this spring four to six weeks earlier than usual. Aecia on barberry were quite prevalent for the first time in many years in the vicinity of Moscow. Early uredial infection on wheat was observed and the spread was quite rapid for a time; however, the weather conditions of the past two weeks have not been conducive for the best development of the fungus.

WASHINGTON

AGRICULTURAL EXPERIMENT STATION, PULLMAN (Wheat Improvement, O. A. Vogel) (July 20)

The spring wheat nursery at Pullman appears to be as much of a disease garden as a varietal nursery. Powdery mildew, stripe rust, and leaf rust were prevalent during the cool weather, following the heading and flowering stages. At present, however, stem rust appears to be doing more damage than all the other diseases combined. Only one variety, a Jenkin x Hope hybrid, appears disease free.

The winter wheat varietal nursery at Pullman was harvested on Monday and Tuesday of this week. The yields are expected to range between 40 and 70 bushels. The high yields are expected from the later maturing varieties which resulted from very favorable growing and ripening periods.

The winter wheat varietal nursery at Walla Walla was harvested and threshed on the 9th. The yields shown in the accompanying table are good. Several of the short-strawed varieties are among the highest yielders.

Stem rust has caused considerable damage in some winter wheat fields in Whitman County, and is now heavy in many fields of spring-sown Federation.

Data on winter wheat varieties in the nursery at Walla Walla, Wash.

Variety	C. I. No.	Plant height	Grade	Test weight per bushel	Average
		Inches		Pounds	Bu. per acre
Fortyfold x Hybrid 128	11755	40	VI c	58.9	49.8
Hybrid 128 (check)	4512	46	VI c	59.4	45.2
Jenkin	5177	47	VI c	58.8	45.2
Federation	4734	41	VI b	60.7	45.0
Fortyfold x Federation	11693	39	VI b	58.2	44.8
Triplet selection R4-29	-----	40	IV c	60.0	44.3
Turkey-Florence x Fortyfold-Federation--1	-----	40	VI b	60.6	44.3
Hybrid 128 (check)	4512	46	VI c	59.4	43.8
Triplet	5408	43	V b	61.1	43.8
Rio	10061	42	IV c	62.2	43.7
Ridit x Utah Kanred	11597	45	IV c	62.7	43.7
Oro x Hybrid 128-11	-----	44	VI b	59.7	43.5
Ridit x Utah Kanred	11599	42	IV c	61.8	43.2
Golden	10063	41	VI b	58.4	43.0
Oro x Hybrid 128-2	-----	43	VI b	58.4	43.0
Albit	8275	44	VI c	59.1	42.8
Hymar	11605	44	VI c	58.9	42.5
Rex	10065	44	VI b	60.2	42.3
Oro	8220	43	IV c	61.4	41.7
Kharkof (check)	1442	41	IV c	60.8	41.7
Relief	10082	45	IV c	61.8	41.5
White Holland	11399	44	VI b	58.2	40.5
Rex selection M2	11690	44	VI b	60.3	40.3
Fortyfold	4156	42	VI b	59.7	40.3
Triplet x Oro (awnless bulk)	11694	44	V b	60.6	40.2
Triplet x Oro (awned bulk)	11695	43	V b	61.3	40.0
Yogo	8033	44	IV c	61.7	40.0
Rex selection M1	11689	44	VI b	61.0	39.8
Hybrid 128	4512	45	VI c	59.0	39.7
Turkey	6175	43	IV c	61.1	39.7
Kharkof	1442	42	IV c	60.6	39.5
Oro x Hybrid 128-9	-----	42	VI b	59.2	38.8
Oro x Hybrid 128-17	-----	43	VI b	60.3	38.7
Oro x Hybrid 128-8	-----	44	VI b	60.1	38.5
Oro x Hybrid 128-16	-----	44	VI b	60.7	37.8
Ridit	6703	45	IV c	62.0	37.5
Oro x Hybrid 128-15	11758	42	VI b	61.2	36.2

OREGON

AGRICULTURAL EXPERIMENT STATION, CORVALLIS (Foot Rots of Wheat, Roderick Sprague) (July 17)

Data were taken in the footrot and smut plots on High Prairie on June 20-22. The plots were visited by Messrs. C. A. Suneson and J. Foster Martin on the 22d. The soil-borne low smut was not so serious as it had been in 1937, but there was about 30 to 35 percent smut in susceptible varieties. The first date of seeding made Sept. 4, which emerged within 4 to 5 days during warm weather, had more low smut than the later seedings. Hymar, Rex, and Relief were again resistant, Hybrid 128 and Golden very susceptible, and Holland moderately resistant. The winter barley Olympia, originally imported from Germany by E. F. Gaines, continued to be promising on footrot ground. About 45 acres will be harvested this year, furnishing ample seed for additional local trials.

The Idaho prairies near Nezperce and Cottonwoods were visited with Mr. Wayne Bever on June 28. Footrot was very spotted but very severe in certain fields. One 800-acre field of hard winter wheat near Nezperce showed 25 to 40 percent loss. The culms were badly tangled, off-color, and mostly rotted, and the heads small. The cercosporella footrot was found in a large number of fields where it had not been found in 1934, particularly towards the top of the Cul-de-sac grade and near Craigmont on cut over land which is not often found harboring the footrot. The loss for the area may amount to 60,000 bushels. Discontinuing the growing of Turkey and other bearded varieties, Goldcoin and Triplet would materially reduce the loss in certain fields in this region.

Footrot was also scattered in the Palouse. There was a great deal of lodged grain along the highway between Pullman and Spokane, but most of it was not diseased or showed only some weakening due to Wojnowicia in the lumen. A large area of cercosporella footrot was found west of Spangle towards Cheney. This region extended surprisingly far east and north and bordered a scab rock area in places.

Footrot was said to be serious near the Idaho border on the old Palouse Highway but this was not seen. Damage in the footrot area in the Spokane valley and adjacent prairies was not serious.

Counts have been completed in all of the seed treatment trials. Smut was very heavy in the check rows at Pendleton, Moro, and Condon. Even the spring-sown Union wheat had 85.5 percent smut in the check rows at Pendleton and some of the fall-sown Hybrid 128 had 99.5 percent smut. At Corvallis there was some smut and more take-all in the seed treatment trials. Spring grain in the Willamette valley was the poorest in years. Leaf rust was present, but neither stem rust nor crown rust was found in the small grain plots.

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C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 August 10, 1938 No. 12

Personnel (July 26 - Aug. 10) and Field Station (July 16 - 31)

PERSONNEL ITEMS

Dr. E. G. Bayfield came to Washington on August 10 for a 3-day conference with Bureau officials on the subject of milling research.

Mr. Jenkin W. Jones left Washington August 8 for a 2-month trip in Louisiana, Texas, Arkansas, California, and Missouri to study cooperative experiments with rice, make crosses and selections, and confer with State agricultural experiment stations regarding cooperative rice experiments.

Dr. John H. Martin left Washington on August 10 for his usual summer trip in the sorghum producing States, Nebraska, Kansas, Oklahoma, Texas, New Mexico, Arizona, Colorado, South Dakota, and Illinois. He will spend about 10 days at Lawton, Okla., harvesting the sorghum breeding nursery. From there he will go to Tucson, Ariz., to attend the meetings of the Western Branch of the American Society of Agronomy, to be held from August 31 to September 2.

Press notices of July 29, 1938, carried an account of the disappearance, on July 28, of the Hawaii Clipper of the Pan American Airways en route from Alameda, California, to Manila, Philippine Islands. Mr. Fred C. Meier, principal pathologist in the Bureau of Plant Industry, in charge of a special aerobiological investigation concerned primarily with the aerial dissemination of plant diseases, was a passenger on this plane en route to the Philippine Islands in connection with studies concerned with this project.

Mr. Meier first started his services in the United States Department of Agriculture in 1918 as an assistant pathologist in the former Office of Cotton, Truck, and Forage Crop Disease Investigations, making important contributions toward the solution of watermelon wilt and stem end rot problems. Later, in conjunction with others, he laid the foundation for investigations of storage and transit diseases of vegetable crops. He served as extension pathologist employed jointly by the Bureau of Plant Industry and the Extension Service from 1922 to 1929.

In December 1929, he was placed in charge of Barberry Eradication when that activity was separated from the Cereal Division and set up as a separate division in the Bureau, transferring with Barberry Eradication to the Bureau of Entomology and Plant Quarantine when regulatory activities of this nature were transferred to that Bureau late in 1933. In 1934 he transferred to the Extension Service, where he was engaged in coordinating activities in the northeastern area. On July 10, 1938, he again transferred to the Bureau of Plant Industry for detail to the special project on which he was engaged at the time of the disappearance of the Hawaii Clipper.

A host of friends in the Department and in the State Extension and Experiment Station services are naturally reluctant to give up hope, although circumstances do not warrant undue optimism.

RECENT PUBLICATIONS

Coffman, F. A., and Stanton, T. R. Variability in Germination of Freshly Harvested Avena. Jour. Agr. Research 57(1): 57-72. July 1, 1938. (G-1096)

Rhoades, M. M. Effect of the Dt Gene on the Mutability of the a_1 Allele in Maize. Genetics 23(4): 377-397, illus. July 1938.

Vogel, O. A. The Relation of Lignification of the Outer Glume to Resistance to Shattering in Wheat. Jour. Amer. Soc. Agron. 30(7): 599-603, illus. July 1938. (Cooperation between the Division of Cereal Crops and Diseases and the Farm Crops Section of the Washington Agricultural Experiment Station.)

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

VIRGINIA

ARLINGTON EXPERIMENT FARM, ROSSLYN (Small Grain Agronomy, J. W. Taylor) (Aug. 5)

Small grain threshing has been completed. The season was especially favorable to fall-sown oats, as the crop was the highest yielding ever harvested at Arlington Farm. Lee, with an average of 84.2 bushels, was high.

Winter barley yielded better than average. Weed competition cut the barley yield appreciably. Smooth Awn 86 and the two Nakano Wase selections, both awnless, yielded high.

Wheat yields were cut by stem rust, especially the check variety Purplestraw. In general, yields were about 10 percent below average.

Average yield of winter wheat varieties grown in triplicate 1/40th-acre plots and percentage of the yield of the nearest Purplestraw check plots, at the Arlington Experiment Farm, 1938.

Variety	C.I. No.	Yield (Bu. per acre)	Percentage of nearest check average
Gasta	11398	37.6	122.1
Early Fulcaster 2008-1	-----	38.1 1/	120.6
Nittany	6962	30.9	100.3
Poole	1979	30.5 1/	96.5
Wharton	10071	30.5 1/	96.5
Fultz	1923	31.4	95.4
T-44-55	----	29.1	94.5
Red Wonder	5780	30.6	91.1
Dietz	1981	28.7 1/	90.8
Dixie	10070	28.2 1/	89.2
V.P.I. 131	10047	27.2	88.3
Trumbull	5657	27.9	88.3
Leap	4823	27.8	88.0
Shepherd	6163	29.2	86.9
Leapland	11726	28.4	86.3
Fulcaster	1945	28.0	85.1
Mammoth Red	2008	27.9	84.0
Arlando	10069	26.6	84.2
Forward	6691	26.4	78.6
Missouri Bluestem	1912	23.4	69.6

1/ Duplicate plots.

Average yield of winter oat varieties grown in triplicate 1/40th-acre plots and percentage of the yield of the nearest Lee check plots, at the Arlington Experiment Farm, 1938.

Variety	C. I. No.	Yield (Bu. per acre)	Percentage of nearest check average
Winter Turf	541-4	92.3	97.3
Randolph	2275	92.1	97.0
Custis	2041	91.0	95.9
Fulghum 699-2011	2499	88.7	94.8
Culberson	273	88.1	94.1
Winter Turf	431	89.2	94.0
Fulghum 699-202	2498	84.1	89.9
Fulghum	708	82.4	88.0
Sporen	2506	80.9	85.2
Coker 32-1	3026	70.4	75.2

Average yield of winter barley varieties grown in duplicate 1/80th-acre plots and percentage of the yield of the nearest Wisconsin Winter check plots, at the Arlington Experiment Farm, 1938.

Variety	C. I. No.	Yield (Bu. per acre)	Percentage of nearest check average
Smooth Awn 86	6268	56.4	127.9
Nakano Wase 68	6272	44.3	116.0
Nakano Wase 33	6269	42.5	111.3
Tennessee Winter (Johnson)	6034	49.9	110.2
Mechanical Mixture	4115	44.1	107.3
Composite Cross	5530	43.2	104.1
Do	4116	42.1	101.4
Alaska	4106	41.5	101.0
Tennessee Winter	257	41.2	100.2
Tennessee Winter No. 66	3546	44.8	98.9
Esaw	4690	44.1	97.4
Han River	2163	40.2	96.9
Tennessee Winter No. 12	3534	39.9	96.1
Orel	351	38.3	93.2
Smooth Awn 203	6267	40.1	90.9
Tennessee Winter x Smooth Awn	----	34.3	90.5
Gaddis	6003	34.1	89.3
Hooded selection 6	6270	33.6	88.7
Hooded 16	----	32.9	86.8
Beardless 6	2746	38.6	85.2
Woods (hooded)	6235	31.4	82.2
Hooded 11	----	31.0	81.8
Poland	6280	26.4	69.7
Kentucky Smooth Awn 11	6021	29.1	66.0
Nobarb	6120	23.4	53.1

LOUISIANA

RICE EXPERIMENT STATION, CROWLEY (Rice Agronomy, J. M. Jenkins) (Aug. 4)

The average temperature for July 1938 was lower than that for July 1937, but the precipitation was greater. In the first six days there was very little precipitation, and temperatures were rather high, reaching 96° on the 6th, which was the highest for the month. The minimum temperature for the month was 72°, and the monthly mean was 82° or 1° lower than for July 1937.

The total precipitation of 7.82 inches occurred on 14 days, and was 2.45 inches more than in July 1937 and 1.69 inches more than the 28-year average for July.

The heavy rainfall dispelled all fear of damage to the rice crop by salt water from the Gulf entering the streams used for irrigation purposes.

While the abundant precipitation was necessary for medium and late maturing rices, it caused great inconvenience in the harvesting of early maturing rice and probably will cause some damage to this portion of the commercial crop.

In late July most commercial fields of rice were not so promising in appearance as they were earlier in the season. Early rices do not indicate heavy yields, and much of the crop as a whole is badly infested with red rice and other weeds.

The Station plots in general are in satisfactory condition. Early rices are heading and some sown the middle of March will be mature in early August. The growth of cotton is exceptionally good. The heavy rains, however, are causing the "casting" of small bolls.

According to "Estimate Rice Acreage 1938," compiled by The Rice Millers' Association July 16, 1938, the total commercial acreage of three rice varieties released by this Station is 185,110, distributed as follows: Rexoro 106,293; Fortuna 29,898; Nira 48,919. In 1937, the total commercial acreage in these three rices was 100,417, distributed as follows: Rexoro 53,727; Fortuna 24,218; Nira 22,472. Nira increased in Arkansas from 1,550 acres in 1937 to 10,510 acres in 1938.

Mr. Manuel A. Tamargo, Head of The Grain and Root Crops Bureau, Habana, Cuba, was a Station visitor July 29.

MINNESOTA

AGRICULTURAL EXPERIMENT STATION, UNIVERSITY FARM, ST. PAUL (Wheat Breeding, E. R. Ausemus) (Aug. 2)

Harvest is now general in Minnesota as far north as Crookston. Threshing is being done in the southern and western parts. Windrowing and combining was being done in the Red River Valley.

Yields are satisfactory, according to early reports from southern Minnesota. In the southwestern part wheat was badly affected by scab and blight. There does not seem to be any scab at Morris or north of that point. Ceres and Marquis were killed by stem rust and will give both low yields and test weight of grain. Reward, while attacked by stem rust, appeared to escape serious injury and may give fair yields with good test weight. One field of Reward at Georgetown tested 60.5 pounds per bushels.

Harvesting at University Farm has been completed and threshing will commence this week.

The rainfall during July was 3.12 inches. The maximum temperature was 92.5° recorded on July 12 and the minimum was 52° on July 22. The humidity has been high, the records showing 100 percent at some time during the night throughout the month. The lowest humidity recorded was 82 percent.

TEXAS

TEXAS SUBSTATION NO. 4, BEAUMONT (Rice Production and Improvement, H. M. Beachell) (E. C. Tullis) (July 25)

Cercospora oryzae leaf spot was found July 14 on rice plants in the nursery at the Rice Branch Experiment Station, Stuttgart, Ark., and on plants in commercial fields in the vicinity. It was evidently just beginning to show, as only a few infected plants were found in commercial fields. So far none has been found on rice in Texas.

Rice growing on new land in the vicinity of Kevill, Ark., between Clavendon and Brinkley, was found to be quite severely infested with Piricularia oryzae. Leaf spotting was found but no crown injury was noted. Digitaria sanguinalis with a severe Piricularia infestation was found on border levees of affected fields. Affected plants of this grass also were found growing in and along the levees of fields. Infection had no doubt spread from this grass to the rice.

Piricularia leaf spot also was found by Messrs. Beachell and Adair on July 19 in a field south of Nome, Texas. Entyloma leaf spot was found in Arkansas during the week of July 11-16, and in Texas the week following.

Helminthosporium leaf spot is generally present in the rice growing areas around Stuttgart and Beaumont. The spotting of plants is more severe in Texas than in Arkansas. A few quite severely spotted fields have been reported but for the most part only a trace is found in commercial plantings. Abundant spotting is found on nearly all the rice at Texas Substation No. 4, insuring satisfactory condition for uniform infection not only in the leaf spot nursery, but in the nursery as a whole.

TEXAS SUBSTATION NO. 6, DENTON (Wheat Improvement, I. M. Atkins) (July 31)

Weather conditions in July have been unusual in that cloudy, rainy weather has prevailed during the past two weeks. Excessive rains over the State have caused a number of serious floods. The precipitation for July was 2.29 inches, or 0.18 inch above normal. The maximum temperature recorded was 101°, the minimum 68°, and the mean 83.4°, which is 0.6° below normal.

Threshing of all experimental grain was completed during the month. Yields of varieties grown in field plots are shown in the accompanying tables. Yields of wheat at Denton were better than expected and reflect in a large measure resistance to stem and leaf rust. Leading varieties, Oro x Tenmarq and Kawvale x Tenmarq, combine some resistance to both diseases with earliness, thus enabling them to escape stem rust damage.

Yields of fall-sown oats at Denton were very high, and the grain is of excellent quality. Yields of spring-sown oats reflect resistance to crown rust and earliness, enabling the very promising new Fulghum x Victoria 12-34-33 strain to outyield all other strains by a wide margin. The quality of this strain was outstanding, weighing 32 pounds per bushel, compared with 24 pounds for most other strains. The new Wintex (5-31-62) barley again outyielded all other strains by a wide margin, although the new smooth awn Harlan Hybrid 1-33-7 ranked second in yield.

Average yield of wheat varieties grown at Texas Substation No. 6, Denton, Greenville, Amarillo, Bushland, and Chillicothe, Texas, 1938.

Variety	Number C. I.	Number T. S.	Denton	Green-ville	Amarillo	Bush-land	Chilli-cothe
Denton	8265	9236	19.8	13.2	25.3	8.7	17.9
Mediterranean selection	10086	3015-81	19.9	14.4	----	----	----
Do do	11525	5933-23	18.3	12.1	----	----	----
Do do	10085	5933-20	----	10.8	----	----	----
Do do	11526	5933-34	20.1	12.3	----	----	----
Campbell Mediterranean	-----	23250	21.6	----	----	----	----
Denton x Kanred 4-33-28	-----	-----	22.1	----	----	----	----
Fulcaster	6471	7082	18.7	11.1	----	----	----
Clarkan	3858	20400	23.5	12.1	----	----	----
Kawvale	8180	12577	21.5	12.5	25.2	9.2	15.1
Tenmarq	6936	12578	21.9	14.1	23.2	10.2	21.0
Blackhull	6251	7172	20.1	----	23.3	9.4	20.5
Kanred	5146	11763	18.4	----	24.3	9.2	18.7
Kharkof	1442	16830	11.5	----	27.3	10.0	18.3
Quivira	8886	15833	22.5	----	21.9	8.4	19.1
Early Blackhull	8856	15838	23.2	----	21.2	----	9.4
Chiefkan	11754	23276	25.2	----	26.0	8.5	22.6
Oro x Tenmarq	11673	24951	29.1	----	24.2	----	16.6
Kawvale x Tenmarq	11669	-----	28.8	----	22.1	----	20.3
Kawvale x Tenmarq 35-34-96	-----	-----	26.0	----	----	----	----
Martin x Tenmarq 50-33-23	-----	-----	19.9	----	----	----	----
Martin x Tenmarq 50-33-63	-----	-----	23.4	----	----	----	----
Martin x Tenmarq 50-33-65	-----	-----	----	----	22.0	----	----
Fultz	-----	-----	----	13.6	----	----	----
Mediterranean 3015-63 x Hope 41-17-5	-----	-----	----	6.5	----	----	----
Cheyenne	8885	18566	----	----	24.6	9.4	19.3
Vaughn Turkey	-----	15133	----	----	25.2	9.4	18.2
Certified Turkey	1558	-----	----	----	22.9	9.6	17.2
Martin x Tenmarq 50-34-128	-----	-----	----	----	----	----	19.0

Average yield of oat varieties grown at Texas Substation No. 6, Denton, and Greenville, Texas, 1938.

Variety	Number C. I.	Number T. S.	Denton Fall-sown	Denton Spring-sown	Greenville Fall-sown
Nortex	2382	9235	92.7	54.7	44.9
New Nortex	----	1401-24	92.9	47.4	46.8
Texas Red Rustproof	2503	1118-69	91.8	47.4	43.3
Do	----	1415-12	98.7	53.4	49.1
Ferguson 922	2150	9400	95.5	50.4	46.4
Frazier	2381	9234	78.5	48.7	12.5
Fulghum x Victoria 12-34-33	----	----	92.2	63.5	----
Fulghum x Victoria 12-34-13	----	----	----	----	----
Kanota x Victoria 13-33-70	----	----	96.1	53.0	39.7
Appler x Bond 15-34-64	----	----	88.1	----	----
Nortex x Victoria 11-34-103	----	----	95.6	49.4	----
Nortex x Victoria 11-34-3	----	----	97.0	47.6	29.0
Nortex x Victoria 11-34-4	----	----	----	----	36.7

Average yield of fall-sown barley varieties grown at Texas Substation No. 6, Denton and Greenville, Texas, 1938.

Variety	Number C. I.	Number T. S.	Denton	Greenville
Finley	5901	12576	41.9	----
Bailey	5902	23241	46.8	----
Wintex (Smith 8-31-62)	6127	23258	58.5	24.7
Tennessee Winter	3545	15826	40.8	25.0
Do	6125	15825	41.2	----
Do	6128	23259	43.4	----
Ferguson Texas Winter	----	-----	48.4	----
Harlan Hybrid 1-33-7 1/	----	-----	49.7	----
Harlan Hybrid 1-33-179 1/	----	-----	43.1	----
Harlan Hybrid 1-33-249	----	-----	48.9	----
Harlan Hybrid 1-32-103	----	-----	45.4	----
Missouri Beardless	----	-----	----	23.7

1/ Smooth Awn.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Grain Sorghum and Broomcorn, J. B. Sieglinger) (Aug. 1)

The last half of July was favorable for crop growth. Rains came when needed. The sorghums have grown so rapidly that only two cultivations were possible before they were too tall.

Stands are being counted and bagging of seed heads will require attention at once.

The maximum temperature for the last half of July was 100° on the 27th and the minimum 62° on the 22d. The precipitation was 2.09 inches; the total for July is 3.10 inches.

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (Aug. 1)

Rainfall in July, as in the previous five months, was above normal. The total for July and for the first seven months of 1938 was 3.10 and 24.85 inches, respectively, as compared with the 24-year station average of 1.97 and 13.35, respectively. Average minimum, maximum, and mean temperatures for July were 69°, 94°, and 81°, respectively. Temperatures of 100° or over were recorded on 10 days in July.

Pastures, row crops, trees, shrubs, and flowers are responding vigorously to the generous rainfall.

Threshing of head selections is in progress at present. Yields from the nursery material in general were high. Test weights per bushel were low. The agronomic and yield data for the varieties grown in the uniform yield nursery in quadruplicated, 3-rod row plots at the Woodward Field Station in 1937-1938 are as follows:

Agronomic and yield data on winter wheat varieties grown in the uniform yield nursery in quadruplicated 3-rod row plots at the Woodward Field Station, 1937-1938

Seeded October 8, 1937 — Emerged October 17, 1937

Variety	C. I. No.	Date First headed	Date Ripe	Height	Lodging	Leaf rust	Test weight	Yield
				(In.)	(Percent)		(Lbs. per bu.)	(Bu. per acre)
			June					
Kawvale x Tenmarq	11669	May 3	10	39	38	11	59	50.6
Do do	11750	May 2	10	42	18	6	57	48.3
Tenmarq x Minturki	11580	May 5	12	42	0	39	58	48.1
Oro x Tenmarq	11672	May 2	11	42	10	43	57	41.0
Kanred x Blackhull	11844	May 4	12	42	T	61	57	39.6
Tenmarq x Nebraska No. 28	11847	May 9	12	45	1	53	60	39.3
Kanred x Marquis	11589	May 3	9	42	1	61	58	38.9
Cheyenne selection	11666	May 8	11	40	3	74	57	36.9
Akron selection 7	11660	May 5	12	42	1	80	58	36.5
Turkey selection	10016	May 4	11	41	0	66	58	36.2
Penquite	11745	May 9	12	42	2	42	59	36.0
Kanred x Marquis	11746	May 8	13	35	3	40	58	35.9
Oro x Tenmarq	11673	May 2	11	41	11	29	57	35.8
Early Blackhull hybrid	11846	May 6	12	44	10	59	55	35.7
Turkey x Marquis	11747	May 6	13	41	1	74	57	35.2
Turkey selection	11734	May 13	12	42	0	78	58	34.8
Do	10094	May 9	11	40	6	74	57	33.7
Sibley No. 62	11523	May 11	12	41	7	63	55	32.6
Minturki x Blackhull	11815	May 12	14	44	1	69	58	31.5
Turkey selection	11577	May 11	13	39	9	79	55	31.8
Oro x Fulhard	11579	May 9	10	41	1	79	57	30.9
Turkey selection	11576	May 12	12	39	6	78	56	28.8
Blackhull	6251	May 9	12	43	30	69	58	27.9
Blackhull selection	11737	May 8	11	41	65	75	56	27.2
Turkey selection	10083	May 11	12	41	9	70	55	26.9
Kanred x (Hard Federation)	11843	May 2	11	39	1	78	55	26.0
Kharkof	1442	May 16	14	41	4	64	56	25.4
Early Blackhull	8856	Apr. 25	7	37	40	75	60	25.0
Minturki x Blackhull	11671	May 11	11	43	0	63	56	24.6
Nebraska No. 60	6250	May 17	14	39	9	70	58	23.5

KANSAS

FORT HAYS EXPERIMENT STATION, HAYS (Cereal Agronomy, A. F. Swanson) (July 30)

The rainfall for July has totaled only 0.86 inches. High temperatures prevailed early in the month but since the 10th the weather has been most pleasant. The sorghum crop is growing satisfactorily and the earlier varieties are heading. Plants are heading at a shorter height than normal, but a good rain at an early date would increase the length of the stalks.

The 1938 winter wheat crop at the Hays station was about normal, even though subjected to many hazards during the growing season. Never for any single season was the outcome more difficult to predict. Low yields and poor quality generally prevailed in the south-central part of the State. The best yield and quality of grain was produced in northwestern Kansas where the prospects were least promising last fall. The low wheat yielding area of Kansas coincides with a region where the May rainfall ranged from 8 to 13 inches. This area is also predominantly seeded to Blackhull which did not seem to be tolerant to too much rainfall during the fruiting period. The yields of winter wheat as averaged from four replicated plots at the Hays station are shown in the accompanying table. Two of the series of plots were on cropped land and two on fallowed land.

Agronomic and yield data on winter wheat varieties grown in four replicated plots, one on cropped land and one on fallowed land at the Fort Hays Experiment Station, Hays, Kans., 1938.

Variety	C. I. No.	Date Headed	Date Ripe	Ht.	Leaf rust	Stem rust	Av. yield (Bu. per acre)	Test wt. (Lbs. per bu.)
				In.	Percent			
		May	June					
Early Blackhull	8856	4	15	33	100	5	21.9	62
Early Blackhull Hybrid (H.C. 364)	----	12	21	39	90	15	24.3	59
Quivira	8886	8	20	37	14	15	31.4	61
Blackhull	6251	14	21	39	70	15	23.6	61
Chiefkan	11754	11	21	39	29	40	31.1	64
Tenmarq	6936	13	20	40	34	33	28.6	60
Oro x Tenmarq	11673	10	21	38	23	15	29.9	62
Kawvale x Tenmarq	11669	10	19	36	0	25	42.0	63
Kanred	5146	16	23	39	59	33	23.6	57
Cheyenne	8885	16	23	40	81	50	23.4	58
Oro	8220	17	23	41	59	33	23.5	57
Kharkof	1442	17	23	39	43	50	22.1	58
Turkey	1558	16	23	39	83	43	24.0	59
Nebraska No. 60	6250	18	23	41	76	70	19.3	58
Turkey selection	10094	16	22	37	96	43	22.2	60
Kanred x Marquis	11589	12	21	39	36	43	30.4	61
Blackhull Hybrid (H.C. 369)	-----	16	21	41	100	10	16.5	58

Stem rust was severe on some of the varieties but cool weather held it in check until near the end of the fruiting period.

NEBRASKA

AGRICULTURAL EXPERIMENT STATION, LINCOLN (Wheat Improvement, K. S. Quisenberry) [Aug. 1]

Average yield per acre and weight per bushel of winter wheat varieties grown in five 1/40th-acre replicated plots, Lincoln, Nebr., 1938.

Variety	Number		Yield	Test weight
	C. I.	Nebr.	(Bu. per acre)	(Lbs. per bu.)
Chiefkan	11754	1100	21.0	57.0
Kawvale x Tenmarq	11669	1086	20.6	55.6
Oro x Tenmarq	11673	1101	18.8	53.7
Turkey selection	10094	1063	17.7	55.4
Cheyenne selection	11666	1087	17.0	56.0
Tenmarq x Minturki	11580	1094	16.7	52.6
Kawvale	8180	1052	16.7	54.1
Clarkan	8858	1084	16.5	54.3
Kharkof	1442	1010	16.3	56.8
Kanred	5146	1003	16.2	55.1
Turkey selection	10016	1069	16.2	54.8
Turkey selection	10015	1062	15.8	56.1
Blackhull	6251	1004	15.7	57.7
Tenmarq	6936	1030	15.7	52.8
Turkey (S. Dak. 144)	3684	1011	15.6	55.3
Turkey (Seward Co.)	-----	1005	15.4	56.0
Turkey (Sonderegger)	-----	----	15.1	57.2
Minturki x Blackhull	11815	1099	14.9	56.5
Kanred x Blackhull	11844	1098	14.6	52.8
Blackhull selection	-----	1092	14.5	57.5
Blackhull selection	11737	1093	14.5	55.6
Turkey	-----	312	14.5	57.8
Turkey selection	11577	1081	14.3	55.3
Cheyenne	8885	1050	13.7	54.8
Turkey selection	11576	1082	13.6	56.2
Nebraska No. 60	6250	60	12.9	54.4
Minturki x Blackhull	11671	1089	12.9	52.6
Turkey	-----	1	12.7	57.8
Turkey selection	11734	1095	12.4	57.7
Oro x Fulhard	11579	1083	12.1	54.8
Oro	8220	1032	11.7	56.1

Average yield per acre and weight per bushel of spring wheat varieties grown in five 1/40th-acre replicated plots, Lincoln, Nebr., 1938.

Variety	Number		Yield	Test weight
	C. I.	Nebr.	(Bu. per acre)	(Lbs. per bu.)
Ceres x Hope-Florence	11708	----	19.0	56.9
Mindum (durum)	5296	1080	19.0	59.9
Renown	11635	----	15.6	56.1
Hope x Ceres	11428	----	15.4	55.0
Komar	8004	1034	14.6	56.3
Ceres	6900	1028	14.0	57.8
Kearney (Java)	6585	1009	14.0	59.0
Reward	8182	1073	13.7	60.3
Thatcher	10003	----	13.5	55.1
Canus	11637	----	9.2	49.7
Marquis	3641	1001	6.1	48.6

Average yield per acre and test weight per bushel of varieties of oats grown in five 1/40th-acre plots at Lincoln, Nebr., 1938.

Variety	Number C. I.	Number Nebr.	Yield (Bu. per acre)	Test weight (Lbs. per bu.)
Victoria x Richland	3310	548	74.2	32.0
Do	3314	549	73.9	32.4
Brunker	2054	535	72.7	33.4
Columbia	2820	538	72.7	33.7
Victoria x Richland	3313	542	71.1	31.8
Do	3302	544	69.4	32.6
Burt	2881	518	68.6	31.3
Trojan	2491	552	65.2	31.6
Fulghum x Markton	3327	550	64.5	33.3
Markton x Rainbow	3247	547	64.5	36.8
Burt	2888	520	64.3	32.9
Kanota	839	508	63.2	32.5
Richland selection 52	3008	541	63.2	30.6
Burt (common)	293	506	62.8	32.3
Kherson (Nebr. 21) large	----	536	61.6	31.2
Kherson (Nebr. 21)	841	504	61.4	31.8
Richland	787	540	61.3	30.9
Texas Red	----	531	60.9	30.7
Fulghum (Coker No. 3)	----	539	60.5	32.8
Rainbow	2345	551	59.3	31.1
Iowar	847	510	58.0	30.9
Markton x Iogold	3236	543	57.8	31.6
Do	3237	545	57.6	32.1
Iogold	2329	512	56.4	28.8
Kherson (Nebr. No. 5)	----	505	56.1	28.6
Markton x Iogold	3240	546	55.0	33.2
Kherson (common)	----	501	54.6	28.8

Average yield per acre and test weight per bushel of varieties of barley grown in five 1/40th-acre plots at Lincoln, Nebr., 1938.

Variety	Number C. I.	Number Nebr.	Yield (Bu. per acre)	Test weight (Lbs. per bu.)
Flynn selection	5911	107	55.7	44.8
North Platte No. 1	5266	116	50.0	41.1
Club Mariout	261	---	48.7	42.0
Velvon 1/	6109	---	45.7	43.4
Ezond	6265	---	44.9	44.9
Short Comfort	5907	104	44.3	45.8
Ezond	5064	115	44.3	43.2
Spartan	5027	111	42.9	49.6
Odessa 1/	182	---	42.0	44.2
Trebi x Velvet selection No. 4 1/	----	---	41.8	46.5
Trebi	936	105	41.6	42.4
Colsess 1/	2792	110	40.9	40.3
Wisconsin Pedigree 37 1/	5028	---	39.8	45.9
Wisconsin Pedigree 38 1/	5105	---	38.8	45.7
Manchuria (Minn. 184)	2330	102	33.7	44.1
Comfort 1/	4578	108	31.7	45.4
Smooth Awn x Manchuria 1/	----	---	30.7	43.3
Ioglos 1/	6239	---	28.7	45.1
Velvet 1/	4252	---	24.8	45.3
Glabron 1/	4577	109	24.6	46.0
Manchuria (N. Dak. 2121 1/)	2947	---	24.0	43.3
Wisconsin Pedigree 5-1 1/	1272	---	21.5	44.9

1/ Damaged by grasshoppers.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (Aug. 3)

Generally favorable climatic conditions prevailed during the last half of July. The wheat, oat, and barley varietal plots, wheat nurseries, and increase plots have been harvested and should be ready to thresh within the next few days. The grain of Marquis wheat is small and shrunken. Ceres shows somewhat less severe rust injury. The grain of other varieties appears to have a normal plumpness.

Early varieties of flax are ripening and flax is being severely damaged by grasshoppers biting off the bolls. As the early maturing crops were cut, the hoppers moved into the flax and other late crops still standing.

The maximum temperature was 97° and the minimum 51°. The precipitation was 1.45 inches.

Moisture and temperature conditions for the year to date have been about average. Rust apparently caused about as much damage to susceptible varieties of wheat as in 1935 and 1937. The total damage from rust appears to be much less severe than in the previous years in the experiment station plots and nurseries and on farms in this locality because a much larger proportion of the wheat sown this year was rust-resistant.

The Agricultural Council for the Northern Great Plains Region met here August 1 and 2 to discuss problems of Government in relation to agriculture in this region. There were about 40 in attendance from out of town, including Undersecretary of Agriculture M. L. Wilson, H. R. Tolley, Chief of the Agriculture Adjustment Administration, and other representatives of the A.A.A., Bureau of Agricultural Economics, Farm Security Administration, and other Federal and State agricultural agencies.

AGRICULTURAL EXPERIMENT STATION, STATE COLLEGE STATION, FARGO (Wheat Improvement, G. S. Smith) (Aug. 1)

The total precipitation for July at Fargo was low,--less than 2 inches, but fortunately the temperature was nearly normal. Other sections of the State have fared better with respect to moisture and Langdon received over 5 inches for the month.

The Fargo nursery has ripened rather rapidly,--about four weeks after heading, so the grain will be only moderately plump. However, the quality of the durum wheats in the nursery is the best since the work began here. Harvesting is pretty well along. Farm fields in the vicinity are showing the effects of drought and rust. Everything is harvested except late planted grain. Sten rust is taking a heavy toll all over the State, though it was stopped somewhat by the drought. Ceres and Marquis fields in the Red River Valley yield from 0 to 10 bushels per acre of 45-to 56-pound wheat. Thatcher, while heavily hit by leaf rust, will probably yield from 5 to 25 bushels of 52 to 60-pound wheat. Thatcher wheat is a big factor in the wheat picture this year, the acreage being surprisingly large. Much of the durum wheat will escape severe rust damage, although late-sown fields southwest of Langdon toward Devil's Lake will in many cases be cut to 55 pounds in test weight, mostly by the rust. In the durum wheat area, harvest is still a week away.

Grasshoppers have moved into the Red River Valley, causing severe damage in many areas, and much grain, even wheat, is being cut green. Late wheat in the Fargo nursery probably will have to be pulled this week to avoid loss because of hoppers. Hoppers have not yet appeared at Langdon, although they are numerous a short distance away.

Sten rust at Langdon is developing into a heavy epidemic in the nursery and good leaf rust notes have already been taken on the common wheats.

WASHINGTON

AGRICULTURAL EXPERIMENT STATION, PULLMAN (Wheat Improvement, O. A. Vogel) (Aug. 5)

The winter wheat crop in the State as a whole is better than average. This is the result of good seeding conditions, a relatively mild winter with adequate snow covering during the cold periods, and a favorable growing season. The protein content of the wheat is below average, however.

The spring wheat crop in the Big Bend and other dry areas looks well. The yields probably will be above average. In eastern Whitman and Spokane counties the spring wheat will not be ripe for 8 to 12 days. The yields in most cases are expected to be from fair to good if favorable weather continues and no further spread of stem rust occurs.

This season has been fairly favorable for the rusts. Stripe rust appeared early in the spring and no doubt did some damage, particularly to the Forty-fold and Golden varieties. However, these varieties have produced a good crop in spite of infections as high as 50 to 60 percent.

Leaf rust also appeared early and reached 75 to 90 percent severity in many fields of winter and spring grain in eastern Washington.

Stem rust appeared early but did not spread very extensively until most of the winter wheat was in the medium to late dough stages. The greatest damage to winter wheat occurred in the vicinity of Colfax, where wheat on the flats and northerly slopes of a number of fields was very badly damaged. However, with a few exceptions, these heavily damaged areas are worth harvesting.

A few fields of spring-sown Federation wheat in eastern Whitman and Spokane counties are so badly damaged by leaf and stem rusts that a prospect for a yield of more than 15 bushels is unlikely. The majority of spring wheat fields that are still immature are expected to yield 25 to 35 bushels in spite of considerable rust damage in many of the flats.

An estimate of the loss due to stem rust in the two above mentioned counties that are expected to produce 15,000,000 to 17,000,000 bushels is 200,000 to 300,000 bushels. No attempt was made to estimate the losses due to the leaf and stripe rusts nor to powdery mildew, all of which were prevalent to a greater extent than in the seven previous years.

Bunt in the winter wheat in the Palouse section is again light. None of the many fields examined had over 1 percent of bunted heads. In the Walla Walla area fall-sown Federation had from 2 to 5 percent of bunted heads in nearly every field examined.

OREGON

PENDLETON FIELD STATION, PENDLETON (Cereal Agronomy, J. F. Martin) (Aug. 1)

Threshing with the combine and nursery thresher was finished on July 30. The threshing of varietal trials and increase plots with the stationary machine will be started tomorrow and should be completed by the end of the week. No weights have been taken as yet. Winter wheat on farms in the vicinity of the Station has averaged about 40 bushels per acre.

Warm weather, uncomfortable but ideal for harvesting, prevailed during most of July. The maximum temperature was 107° on July 21 and 22. The nights generally were cool, however. Only 0.06 inch of rain fell during the month.

SHERMAN BRANCH EXPERIMENT STATION, MORO (Cereal Agronomy, D. E. Stephens) (July 25)

Farmers of the Columbia River Basin in Oregon are harvesting the best winter wheat crop that this area has had since 1928. Yields of from 25 to 40 bushels per acre are being obtained in Sherman County. Because of late seeding, consequent late maturity, and excessively hot weather during the past two weeks, spring wheat yields will not be so good. On the Station all cereals are in the shock and threshing will start this week.

The precipitation at Moro for April, May, and June was 1.82 inches. Just a little more than an inch of this fell in June at a most opportune time for the winter wheat crop. In June and the first 10 days of July moderate temperatures prevailed, but from July 13 to date the weather has been exceedingly warm for this area. The maximum temperatures from the 13th to 25th, inclusive, have been above 90° every day, with three days above 100°. The highest temperature was 107° on July 21. On the night of the 21st the minimum temperature was 80°. This was 4° warmer than any minimum temperature recorded at Moro in the past 25 years. Temperatures above 70° at night are very unusual here.

UTAH

AGRICULTURAL EXPERIMENT STATION, LOGAN (Cereal Agronomy, R. W. Woodward) (Aug. 2)

The stormy period of June continued into July and a minimum temperature of 39° was recorded on the 5th. Clear weather began on the 8th and still prevails over the northern part of the State. Much of the winter wheat has been harvested and high yields are reported in most cases. Little or no disease injury has been noted in most of the fields. Spring-seeded small grains, on the contrary, have a heavy stem rust infection in most fields examined. Mildew is also prevalent. Only occasional fields have shown serious bunt injury but the growing of resistant varieties is quite general.

The mean temperature for July was 67°, which is one of the lowest for many years. Crops in general have made prolific growth and promise good yields. Corn is showing especially good vigor this season.

C. A. Suneson, H. A. Rodenhiser, W. J. Sando, G. A. Wiebe, D. W. Robertson, and T. R. Stanton were visitors during the past month.

ARIZONA

AGRICULTURAL EXPERIMENT STATION, TUCSON (Cereal Agronomy, A. T. Bartel) (Aug. 1)

The small acreage seeded to small grains in Arizona makes these rather unimportant in comparison with the large producing areas. In general, it may be said that climatic conditions in southern Arizona seldom vary greatly from normal. The high precipitation which occurred during the winter and in the early spring months in California and Utah did not occur in southern Arizona. The local rainfall during that period was below normal. The temperature during the growing period for small grains was generally slightly above normal. This caused a little earlier heading but did not seem to affect the plant height or grain yield. There were no diseases other than those usually occurring, that is, smut and sten rust on occasional fields of wheat near Yuma in northern Arizona.

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C E R E A L C O U R I E R

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Personnel (Aug. 11-25) and Field Station (Aug. 1-15)

PERSONNEL ITEMS

Mr. A. T. Bartel, Mr. L. L. Davis, and Dr. John H. Martin have been authorized to attend the meetings of the Western Branch of the American Society of Agronomy to be held at Tucson, Ariz., from August 31 to September 2, 1938, and to present papers.

Mr. Guy N. Collins, since March 19, 1936, a member of this Division as Principal Botanist in charge of the project Genetics and Biophysics, died on August 14, 1938, at the age of 66.

Mr. Collins' work on the genetics of maize and on the application of biometry to our problems is familiar to our staff. His early accomplishments in the Bureau included the introduction of the "hard shelled" Guatemalan avocado which has been used in developing many of the varieties of this fruit now in commercial production in Florida. He also brought back from Mexico the Acala variety of cotton which has proved to be of such excellent quality and which comprises the bulk of the American Upland cotton produced in the Southwest.

With Dr. O. F. Cook he explored Puerto Rico shortly after the close of the Spanish American War and the work entitled Economic Plants of Puerto Rico is still standard.

Before becoming a member of the Department's staff Mr. Collins spent several seasons in Liberia investigating, for the New York Colonization Society, the agricultural possibilities available to repatriated Negroes. While in Africa he served as Professor of Mathematics in the University of Liberia.

His interests were wide and his bibliography shows, in addition to articles on tropical fruits and genetics, one on the South African Pipe Calabash,- a gourd very popular with pipe smokers three decades ago,- and another on the curious Liberian game of Kboo.

While confined during his last illness he undertook to determine statistically the correctness of the opinion held by most managers of baseball teams that right-handed batters are most effective against left-handed pitchers. This study was interrupted by his death.

In losing Mr. Collins this Division has lost one of its most highly regarded members and one whose outstanding characteristics were curiosity and reasonableness.

Mr. Collins' contributions to scientific literature, nearly 70 in number, are of a high quality and cover a wide field, including agricultural exploration, tropical fruits, plant breeding, statistical methods, etc.

Dr. M. T. Jenkins left Washington on August 23 on a trip in the corn-growing areas, including the States of Tennessee, Louisiana, Missouri, Kansas, Nebraska, Iowa, Minnesota, Wisconsin, Illinois, Indiana, Ohio, and Pennsylvania. He will look over cooperative corn breeding experiments and confer with officials of State agricultural experiment stations and of the Department on corn breeding investigations. Dr. Jenkins will be in the field about seven weeks.

Dr. M. T. Jenkins and Dr. M. M. Rhoades spent August 15 and 16 at Ithaca, N. Y., inspecting the cooperative cytogenetic experiments with corn.

RECENT PUBLICATIONS

Th. Dobzhansky and M. M. Rhoades. A Possible Method for Locating Favorable Genes in Maize. Jour. Amer. Soc. Agron. 30(8): 668-675, figs. 1-2. August 1938.

H. V. Harlan and M. L. Martini. The Effect of Natural Selection in a Mixture of Barley Varieties. Jour. Agr. Research 57(3): 189-199, figs. 1-6. August 1, 1938. (G-1099)

H. H. Love and W. T. Craig. Investigations in Plot Technic with Small Grains. N. Y. (Cornell) Agr. Expt. Sta. Mem. 214, 26 pp. June 1938. (Cooperation between the Department of Plant Breeding, Cornell University, and the Division of Cereal Crops and Diseases.)

S. C. Salmon. Generalized Standard Errors for Evaluating Bunt Experiments with Wheat. Jour. Amer. Soc. Agron. 30(8): 647-663, figs. 1-5. August 1938.

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

OHIO

AGRICULTURAL EXPERIMENT STATION, WOOSTER (Corn Investigations, G. H. Stringfield) [Aug. 13]

Ohio usually plants between 3 and 3 1/2 million acres in corn. Recent years have shown a marked increase in the use of hybrids. Nearly all the seed of corn hybrids has been inspected for certification by the Ohio Seed Improvement Association. This close contact with seed producers has made it possible to make good estimates on the acreage planted to hybrids each year. The estimates are as follows:

Year	Acres planted with hybrids in Ohio	Percentage of the total corn acreage in Ohio planted with corn hybrids	Ratio of acreage in hybrids to total acreage
1933	1,100	0.03	1 in 3,334
1934	6,830	.20	1 in 500
1935	14,330	.40	1 in 250
1936	66,330	1.80	1 in 56
1937	303,680	8.00	1 in 12.5
1938	1,398,800	40.00	1 in 2.5

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Grain Sorghum and Broomcorn, J. B. Sieglinger) (Aug. 17)

The first half of August became hot and dry but the short drought was broken by two rains on the 14th and the 15th.

Sorghums and broomcorn are making rapid growth and are heading normally. Bagging of seed heads is the present work on the project, which looks uniformly fine for the first time in many years.

It was noted on a trip to Lawton that western Oklahoma, south of the Canadian River, was much drier than the vicinity of Woodward. The southwestern part of the State received but little rain in July.

The maximum temperature for the first half of August was 103° on the 10th, and the minimum 67° on the 2nd and 15th. The precipitation was 1.45 inches.

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (Aug. 16)

Showers on each of the past three days totaled 1.45 inches and were of considerable value to row crops and pastures, besides providing a welcome relief from the recent hot weather.

The following table presents the average yield and agronomic data on winter barley varieties grown in triplicated 3-row plots at the Woodward Field Station in 1937-38.

Variety	C.I. No.	Spring Survival	Date First headed	Date Ripe	Height	Yield (Bu. per Acre)	Test wt. per bu.
		Pct.			In.		Lbs.
Wintex	6127	95	5-2	6-7	35	81.8	44
Woodward selection 35h9-9	---	88	5-3	6-7	37	75.6	44
Woodward selection 35h10-30	---	98	4-25	6-7	35	71.3	44
Wisconsin Winter	2159	80	5-4	6-9	36	70.9	43
White Winter 34h2012-1	---	100	4-29	6-6	37	67.5	45
Woodward selection 35h319-2	---	97	4-29	6-8	34	67.1	45
Woodward selection 35h319-1	---	98	4-29	6-7	35	65.3	46
Michigan Winter	2036	100	4-30	6-6	37	62.5	44
Woodward selection 35h11	---	100	4-29	6-5	38	61.0	46
Harlan hybrid Tex.1-33-7	---	93	4-30	6-8	32	59.5	42
Woodward Composite	---	83	4-30	6-8	38	58.7	42
Harlan hybrid Tex.1-33-179	---	80	5-3	6-8	35	54.9	43
Smooth Awn No. 86	6268	85	4-28	6-8	38	49.5	42
Ward	6007	100	5-1	6-6	36	47.3	44
Walden Winter	---	100	4-30	6-7	37	47.2	40
Tenn. Winter selection 35h2014-1	---	97	4-29	6-6	37	37.0	43
Missouri Early Beardless	6051	96	4-29	6-5	37	28.4	39

The preparation of 1938-39 seeding plans and packeting of seed is in progress.

KANSAS

AGRICULTURAL EXPERIMENT STATION, MANHATTAN (Wheat Leaf Rust, C. O. Johnston) (Aug. 18)

July was an excellent month for growing crops in most parts of Kansas. Although the mean temperature of 95.5° at Manhattan was 4.5° above normal, there were only 8 days on which the temperature rose above 100°.

The rainfall for the month at Manhattan was 4.54 inches, or 0.16 inch above normal. Measurable rainfall occurred on 9 days but most of the moisture fell in three rains of 0.49, 2.85, and 1.0 inches, respectively, at intervals of about 9 days. The total rainfall for the year up to August 1 is 20.86 inches, which is 1.5 inches above normal.

Owing to favorable weather conditions pastures, gardens, and row crops were in excellent condition on August 1. The prospects for a corn crop in Kansas were the best for many years. Corn near Manhattan was tall and lush with excellent color and vigor. The tasseling period was safely past in most fields and excellent pollination seemed to have occurred. Practically no firing of corn was noted in the vicinity of Manhattan on August 1.

The first two weeks of August were extremely dry and hot. Corn and other crops were injured to some extent by this period of severe weather. However, the hot spell was broken by a rain of more than 4 inches on August 14, 15, and 16. This rain penetrated deeply into the soil and will be of immense benefit to pastures, meadows, feed crops, and corn. Returning from leave through western Kansas yesterday from Goodland to Manhattan the writer noted that pastures and row crops seem in better condition than usual at this time of year. The countryside looks green now, whereas in the past few years it has been brown and scorched. Grasshopper injury to corn was noted in a few fields in western Kansas but most fields of corn and all fields of sorghum seem to have escaped serious injury. At present the prospects seem from good to excellent for row crops in most parts of Kansas.

The 1938 wheat crop continues to be a source of surprise to most observers. As late as June 10 the Kansas crop was estimated at more than 193,000,000 bushels. By July 10 the estimate had shrunk to about 163,500,000, and on August 10 the estimated production was only 149,394,000. In addition to low yields the quality of much of the winter wheat is very poor and great quantities cannot be considered millable grain. To add to the woes of wheat farmers the price of wheat has been very low throughout the season and many growers have binned their crop rather than sell at prices around 50 to 60 cents a bushel. Despite these unfavorable conditions, however, much plowing for the 1939 wheat crop has been done and there is evidence that a large acreage will be sown this fall.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN

(Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (Aug. 17)

The weather during the first half of August was favorable for the development of crops. Harvesting of flax in varietal plots is completed but safflower is not yet ready to harvest. Most of the flax in the main nursery is ripe and harvesting probably will be completed by the end of this week. Fair yields may be expected in spite of severe damage by grasshoppers. Flax in the nursery on flax-sick soil, sown some days later than in the main nursery, is not yet ready to harvest.

Threshing of the wheat, oats, and barley varietal plots and of the wheat nursery is completed. Average rust and yield data from the plots, subject to correction following final checking and cleaning of seed, are presented in the following tables.

The maximum temperature for the first half of August was 100° and the minimum 48°. The precipitation was 0.61 inch.

Rust and yield data on spring wheat varieties grown in triplicate 66th-acre plots at Mandan, N. Dak., 1938

Variety	C.I. No.	Leaf Rust	Stem Rust	Av. yield (Bu. per acre)
		Pct.	Pct.	
Hard Red Spring				
Ceres x Hope-Florence Ns 2592	11712	30	T	20.8
Hope x Ceres NN 1127	11432	12	1	20.1
Ceres x Hope-Florence Ns 2740	11872	1	T	19.4
Thatcher Minn. 2303	10003	57	1	19.4
Double Cross x Ceres-Hope-Florence Ns 2744	--	8 1/	0	19.2
Ceres x Hope-Florence Ns 2634	11708	3 1/	4	19.1
Carleeds	11801	50	2	19.0
Hope x Hard Federation NN 1268	11798	3 1/	5	18.8
Double Cross x Ceres-Hope-Florence Ns 2746	--	1 1/	6	17.4
Hope x Ceres 1098-B	11428	8 1/	5	17.4
Hope x Ceres NN 1250	11786	5 1/	4	17.0
H-44 x Ceres NN 1349	11882	1 1/	0	16.6
Reliance x Hope NN 1110	11433	6 1/	1	16.0
Great Northern	--	3 1/	15 1/	16.0
H-44 x Ceres NN 1348	11870	3 1/	T	15.9
H-44 x Marquis M 1517	11781	4 1/	T	15.8
Apex	11636	28	4	15.4
Reliance x Hope NN 1248	11738	22 1/	T	15.2
Renown	11709	17	1	14.7
Reward	8182	53	82	14.1
Ceres	6900	57	65	11.5
Marquis	3641	43	90	9.4
Durum				
Mindum	5296	2	17	14.5
Kubanka	1440	2	14	14.1

1/ Segregating. T = Trace.

Rust and yield data on oat varieties grown in triplicate 66th-acre plots at Mandan, N. Dak., 1938

Variety	C. I. No.	Crown Rust	Sten Rust	Av. yield (Bu. per acre)
		Pct.	Pct.	
Rusota	2343	2	0	44.0
Anthony	2143	4	0	40.7
Morota	2344	T	0	39.5
Minrus	2144	3	0	39.2
Rainbow	2345	T	0	39.0
Carleton	2378	22	20	37.1
Markton	2053	27	25	36.4
S. Dak. 334	2884	17	0	35.7
Victory	560	2	6	35.3
Richland selection	3008	12	0	34.2
Gopher	2027	17	13	31.1
Sixty-Day	165	15	T	29.4
Iogold	2329	15	0	28.4

Rust and yield data on barley varieties grown in triplicate 66th-acre plots at Mandan, N. Dak., 1938

Variety	C. I. No.	Sten Rust	Av. yield (Bu. per acre)
		Pct.	
N. S. 2752	---	20	11.7
Wisconsin Pedigree 38	5105	15	11.0
N. S. 2753	---	17	10.7
Trebi	936	23	10.1
Ezond	6265	18	10.1
Odessa	182	20	9.3
Horn	926	20	8.5
Steigum	907	22	7.7
Velvet	4252	35	5.3
Glabron	4577	25	4.5

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (Aug. 15)

The precipitation since the first week of July has been confined to light showers, hence harvesting and threshing have progressed with only slight interruption from the weather. Except for safflower field plots have been threshed and nursery threshing began today.

All yields were reduced by grasshopper injury and wheat yields were reduced by rust on susceptible varieties. The yields are not yet computed except for a few varieties. Yields of spring wheat in field plots varied from less than 1 bushel to 13.6 bushels for Ceres x Hope-Florence (2592). The highest yielding varieties of oats and barley yielded about 20 bushels per acre. Test weights of wheat varied from less than 50 pounds to 60 pounds. Early oats weighed about 32 pounds, but other oats and also barley varieties weighed below the standard weight partly because of harvesting while yet green to save from grasshoppers.

Much of the wheat in this locality was not harvested because of effects of rust and loss of heads caused by hoppers. Some fields have been raked to recover the heads thus broken off.

AGRICULTURAL EXPERIMENT STATION, STATE COLLEGE STATION, FARGO
(Wheat Improvement, G. S. Smith) (Aug. 15)

Except for the past weekend, the weather in general has been very favorable for harvest. This was appreciated especially in the Red River Valley where large numbers of combines have been sold.

The large quantity of Thatcher has illustrated very strikingly to the layman the value and possibilities of crop improvement through plant breeding. In general, the Red River Valley is harvesting a good wheat crop because of Thatcher, whereas farther west, where stem rust had not been considered a menace, the Ceres and Marquis fields are badly damaged. Reports indicate that the same is true even in northern Canadian wheat-growing regions. At Winnipeg, the damage of leaf rust to Thatcher and other spring wheats was strikingly illustrated by sulphur dusting experiments. However, compared to the other wheats available, Thatcher has turned in an excellent performance this season and made a great difference in the income of the spring wheat region.

Nursery harvest at Fargo is complete except for some hybrid material that remains to be classified. At Langdon, cooler weather and rains again have held off harvest and the crop is filling nicely. Grasshoppers have been a serious menace at both stations, especially at Langdon, the past week and may clip the heads of green hybrid material.

Durum wheat in general will show about the same injury from stem rust as in 1937, with many heavy-test-weight fields resulting from the extra early seeding which was possible this year. Stem rust on duruns, Mindum and Kubanka, was slow in developing, but in late fields readings up to 50 percent may cause reductions in test weight but not to less than 55 pounds per bushel in many cases. Much durum weighing 60 to 62 pounds will be harvested in spite of 20 to 40 percent stem rust. The injury is nothing compared to that in 1935, apparently because in that year root rots and late-season heat were more prevalent.

In the durum hybrid nursery, an abundance of hybrid material shows good rust resistance while Mindum check rows carry 50 to 80 percent.

Recent station visitors were Secretary H. A. Wallace, Dr. C. E. Leighty, Dr. J. H. Parker, Dr. E. R. Ausemus, Dr. F. R. Immer, Dr. H. B. Humphrey, Mr. J. A. Clark, Mr. T. R. Stanton, and Mr. F. A. Coffman.

REPORTS OF THE 1938 WHEAT CROP

The conditions affecting the 1938 wheat crop in the Great Plains and the western region have been so unusual it seemed it might be of interest to devote a portion of the Cereal Courier to special reports concerning the crop. The various field men of the Division were asked to prepare reports of the crop as they saw it. The statements which follow are as received except for such editing as seemed necessary.

The 1938 Wheat Crop in Minnesota

By E. R. Ausemus, St.Paul,Minn.

Minnesota crop prospects, in general, are very good at this date (July 25), although there has been too much moisture for the best growth and development of small grains in most areas.

Winter wheat has been harvested in southern Minnesota and early reports are for good yields with a very good quality of grain. Leaf rust was severe but stem rust did not develop to any extent on Minturki, the commonly grown variety.

Scab developed in spring wheat in the southern part of Minnesota. It appears to be equally bad on all varieties. In some fields in this area 50 percent of the heads are affected. In other sections scab has not developed to any extent. Leaf rust is present in epidemic form but very little stem rust is present. This is largely due to the fact that approximately 85 percent of the spring wheat acreage in Minnesota is Thatcher. This variety, though very susceptible to leaf rust, has proved resistant to stem rust again this year. In the experimental plots at the Waseca, Morris, and St. Paul stations, Ceres and Marquis have been completely killed by stem rust. In the western part of the State, specifically near Morris, spring wheat will give excellent yields and of very good quality. Farmers are estimating their yields in this area at 20 to 30 bushels per acre. Reports for the Red River Valley indicate a good crop of spring wheat.

Wheat is standing up in most fields while barley and oats are badly lodged. Scab is severe in barley in some areas, and crown rust on oats. Undoubtedly crown rust will reduce both the yield and test weight of oats.

Climatic Factors Influencing the 1938 Wheat Crop in Texas

By I. M. Atkins, Denton, Tex.

Climatic factors influencing the small grain crop in 1938 have been most unusual. In north-central Texas the crop was sown under favorable conditions as to moisture and temperature. Starting in January, unseasonably warm weather continued until April, with unprecedented rains during February and March. At Denton, only one period of freezing weather occurred from January 31 until the much-discussed April freeze.

As a result of these conditions, all small grains came out of dormancy early in the season and made rapid growth. Many fields failed to drain properly and much of the small grain turned yellow and growth was checked. In ungrazed fields wheat was 6 to 8 inches tall by March 1. By April 1, one of the most severe leaf rust epidemics on record was well under way. Susceptible varieties, such as Turkey, showed 98 percent infection by this date and later were barely able to head. Tenmarq and many other normally fairly-resistant varieties were highly infected owing to the presence of an abundance of physiologic race 15, whereas normally the most abundant race is physiologic race 9.

Stem rust was first observed on April 22 although it is quite probable that the disease over-wintered. General infection was noted about May 1, which is about two weeks earlier than normal. Below-normal precipitation in April and May, combined with the very cool temperatures of early May, probably prevented a complete failure of wheat in this area due to stem rust damage. Early varieties such as Early Blackhull, Fultz, and Red May were able to mature fairly normally, although in the southern part of the north-central Texas area, even these varieties were seriously damaged. Late maturing varieties such as Denton, Mediterranean, and Fulcaster were seriously injured, producing low yields of shriveled grain. Tenmarq wheat, although seriously damaged in many fields, was injured less than the soft winter wheat varieties.

In addition to the rust, mildew threatened the crop for a time. The relatively dry weather of April and May checked this disease. Armyworms damaged all small grain in this area. Yields of some fields were greatly reduced and major injury to small grain was only averted by natural control by parasites.

The April freeze, reported to have caused large losses in the middle-western States, did no damage to small grains in north-central Texas except for a few early varieties of wheat and barley at Denton. Temperature during the period dropped to 30° F., killing the pollen on early wheat varieties such as Missouri Early Premium and certain hybrid strains which were heading at that time.

Growth was quickly resumed following the April freeze, all small grains heading very early. Barley and wheat headed from 10 days to two weeks earlier than usual. Weather conditions during the early part of May were very favorable, and the growth of foliage throughout the spring was excessive. At harvest time wheat varieties ranged from 35 to 52 inches in height. Below-normal temperatures with very cool nights held the grain in check and continued the fruiting period over a period of a month to six weeks so that grain was able to fill fairly well in spite of rust damage. For example, varieties of wheat that headed April 4 did not mature until May 16, while late varieties heading about April 27 matured about May 30.

Wheat in the middle western section of the State and in the Texas Panhandle was sown under favorable conditions for the most part. The section of the Panhandle north of the Canadian River did not receive sufficient general rains to start the crop satisfactorily, although about one-third of the acreage emerged in the fall. Growth during the spring over the entire area was excessive and as a consequence wheat was in a succulent condition at the time of the April freeze. In western Texas the temperature dropped as low as 18°, causing serious damage. In the southern part of the wheat-growing area all top growth was killed, and in many fields the stands were so thin they were later plowed up. From Amarillo north the damage was small as wheat had not made such rapid growth. In addition, greenbugs were abundant over this area and destroyed wheat in many fields and portions of fields. Finally, the rainfall in May and June was abundant, causing a heavy growth of weeds that caused trouble in harvesting. Wheat reached a height of only 12 to 18 inches, being stunted, thin, and generally poor. Yields and test weights were low.

On the northern Plains favorable spring moisture caused the production of a promising crop of wheat, but the hot weather and insufficient moisture to mature the crop resulted in disappointing yields and low-quality grain.

The middle western portion of the State produced a good crop of wheat, with late-maturing varieties that escaped the freeze. Early Blackhull wheat, which was heading when the freeze occurred, was damaged in varying amounts, ranging from slight damage to nearly complete failure. Excessive rains in this area, both in the spring and as the crop matured, caused the production of chalky grain. A number of destructive hailstorms accompanied the rains, destroying much wheat. Leaf rust was abundant throughout this area early in the season but was checked by the freeze. Stem rust was present but in general was not a factor in determining yields.

Southern Great Plains Field Station, Woodward, Okla.

V. C. Hubbard, July 23, 1938

There were so many factors affecting the 1937-38 crop, and opinions as to causes of crop damage are so varied and conflicting that it is difficult to give a brief summary of the situation.

The fall of 1937 was mild and for the second time in eight years October 15 seedings made sufficient growth to prevent soil blowing. Wheat grew almost continuously all winter. Rainfall was low in January but was high in February, March, April, May and June, totaling 21.75 inches, or 10.37 inches above the 24-year station average for these months.

Ripening was delayed two or three weeks by rains and cool weather. The late rains were, in general, sudden, heavy showers resulting in much run-off so that, in spite of the relatively high rainfall, the wheat in northwestern Oklahoma suffered from drought during the hard-dough and ripening periods. Some premature ripening of late varieties resulted.

Wheat over much of Oklahoma was from 4 to 12 inches high and was growing vigorously when the most severe blizzard in the history of the State struck (April 7). Minimum temperatures at Woodward were 22° F. Many varieties at Woodward had started to joint and heads of several early varieties were in the boot. Snow estimated at 4 to 14 inches fell in northwestern Oklahoma. Strong winds swept much of it into drifts so that its protection to the wheat was varied and doubtful. Blackening of the leaf tips was very common but no reports of complete killing came to the writer's attention. Rains were opportune and wheat apparently developed and headed about normal; at least variations from normal might easily have been due to causes other than the freeze. Some sterile heads were evident but no more than might be found in many years when late freezes do not occur. The number of sterile florets was surprisingly small. Some blackened lower nodes were evident but culms so affected stood as well as others. Wheat in the Oklahoma Panhandle had not reached the jointing stage and leaf injury was the only apparent effect of the freeze.

Lodging was much more prevalent than usual. Early Blackhull and Blackhull appeared to lodge more than other commercial varieties. Lodging consisted usually of a general bending or curving of the stems and sometimes a breaking near the base of the plants, except in Blackhull. The stems of this variety broke at about the fourth node or internode, leaving a rather flat table appearance to the field.

Low test-weight grain was common over most of Oklahoma. In the Woodward nursery, a very high correlation between test weight and lodging was observed, although undoubtedly factors other than lodging were, in part, responsible for the low test weights. In a surprising number of fields much light wheat was passed through the machine with the straw and, in others nearly as much wheat was left on the ground as was harvested. The best wheat was harvested from the lighter upland soils.

Hail fell during five storms at Woodward but did little damage. In some fields the hail broke the plant tips over, causing many heads to come out through the side of the boot and many heads "goosenecked" before the beards came loose. Some light grain was due, in part at least, to this condition.

Leaf rust developed in early April in southern Oklahoma and by May 1 readings of 80 to 90 percent were common over whole counties in north-central central, and southeastern Oklahoma. Entire fields were completely defoliated by May 15. Damage was slight in northwestern Oklahoma. Some observers feel that lodging because of the heavy beating rains would have been more severe if leaf rust had not defoliated the plants early.

Stem rust was first observed on May 19 on the Station but developed a week or so earlier in southwestern Oklahoma and probably caused some damage in the lower tier of counties.

Armyworms caused serious damage in small spotted areas in central and southwestern Oklahoma. A Brown Wheat Mite caused damage in several counties in the same area and there were a few reports of slight damage in restricted areas from plant aphids.

In summation, early excessively rank fall, spring, and summer growth; unusually late severe freezes with wheat in or approaching the jointing stage; dust storms; more than double the normal rainfall; premature ripening; several hail storms; an early severe epidemic of leaf rust; stem rust; an unusual amount of lodging; armyworms; plant aphids; Brown Wheat Mite; and a delayed harvest all contributed in varying degrees to an Oklahoma wheat crop less than expected and of low test weight. In spite of, and in cognizance of, these damaging factors the July 1 Oklahoma crop estimates indicate a yield of about 58,500,000 bushels as compared with the 10-year average of 44,000,000 bushels.

Wheat Foot-rots in Kansas in 1938

By Hurley Fellows,
Agricultural Experiment Station, Manhattan, Kans.

The take-all foot-rot was quite abundant, particularly on the heavier soils in certain sections of central Kansas in 1938. Very little was found on the lighter more sandy soils even though take-all had been found there in previous years. The crinkle-joint symptom in the upper joint was more prevalent this year than ever before. This was probably because of the excess moisture throughout central Kansas and the late appearance of the disease.

In eastern and central Kansas wheat ripened prematurely and did not fill as well as expected. This has been attributed variously to late frost, rust, excess moisture, and foot-rot, with a varying amount of emphasis placed on each. The writer is not inclined to believe that frost caused much damage, since the plants were able to grow vigorously and to good height after the frost. It is true that there were some frost-blighted heads in early varieties. Excess moisture was probably the factor responsible for most of the trouble. The soil was saturated to the point of run-off over a long period and it was during this time that large areas in the field showed white heads. Later many of the plants crinkled at the joints. Septoria in many cases was associated with the broken joints. Crinkle-joint in the upper node is often associated with drowning injury. It seems unlikely that foot-rot was entirely responsible for the premature ripening and poor filling. However, the crowns of affected plants were water-soaked and spongy, which symptoms are typical of drowning injury. Rusts, both stem and leaf, caused considerable damage.

The dryland foot-rot of the semiarid regions was not particularly severe except in isolated sections. This was perhaps due to the dryness of the soil in the fall, which prevented prompt germination in early-sown wheat. This disease was quite prevalent in early-sown summer-followed land which had enough moisture to permit prompt germination. In some of the sandy regions of northeastern Colorado, wheat was injured so badly by foot-rot that it was not harvested.

The Deterioration of the 1938 Winter Wheat Crop in Kansas

By C. O. Johnston,
Agricultural Experiment Station, Manhattan, Kans.

The 1938 winter wheat crop in Kansas developed under the most unusual combination of unfavorable growth and environmental conditions ever observed by the writer. As a result, the crop, which as late as June 10, was officially estimated at 193,000,000 bushels, now (July 26) is estimated at approximately 163,000,000 bushels, and that seems rather high. There is no general agreement among observers as to just what happened but it is generally agreed that the crop, which had all of the earmarks of bumper proportions in March, slumped quickly and badly as it neared maturity. Thousands of acres estimated at better than 20 bushels per acre in early May actually yielded 5 to 10 bushels per acre. Also, the quality of much of the grain, as measured by test weights, is very poo

The behavior of the wheat crop over much of the State was about as follows: Where soil moisture was sufficient in the fall, the crop came up to good stands and the plants went into the winter in excellent condition. In some localities there was very little fall growth, owing to deficient soil moisture. Winter temperatures were mild, and survival was excellent. Extremely mild weather in February and March favored a very heavy top growth. The frosts of early April slowed up the development of the plants, and a combination of low night temperatures, heavy leaf rust infection, and excessive rainfall during May retarded growth to such an extent that all of the earlier advantage was lost. Heading was not uniform in most fields; the heading period was greatly prolonged and, in some cases, heading never was completed. Shortly before ripening, the nodes of many plants became discolored (brown or purplish-black), after which they shrank rapidly. When rains followed this condition, the shrunken nodal tissues took up water and became soft, allowing the weight of the head to pull the straw over at the uppermost node. In some fields in southern Kansas 90 percent of the straw was buckled at this node. Many of the straws later broke in the constricted nodes. At about the same time, the plants died, leaving soft immature kernels on apparently ripe (actually dead) straw. There was little normal yellow straw, most of it having, instead, a scalded whitish appearance. Also, much of it had brownish or purplish discolorations on the exposed parts of the lower internodes above the tops of the leaf sheaths. This frequently has been called frost damage, but most of this tissue had not yet formed at the time of the freeze. It seems more likely that it is a physiologic response of the plant to interruption of normal flow of nutrients and water and of translocation caused by the diseased condition and constriction of the nodes.

There has been much speculation concerning the causes of the sudden rapid crop deterioration, and many theories have been advanced concerning it. Some of these undoubtedly have some basis in fact, but others have little or no evidence to support them. Two theories which have been widely discussed in the farm press are (1) root exhaustion and (2) latent frost damage. There is no agreement as to what is meant by root exhaustion and the writer has found nothing in the literature that will support any such theory.

Actual frost damage from the April freezes is admitted. There were areas in southwestern Kansas and the Panhandles of Oklahoma and Texas where tillers were killed, leaves and sheaths turned a silvery gray soon after the frost, heads were fully or partly sterile, and many heads failed to emerge from the boot, owing to frost damage. The type and degree of injury depended on the stage of plant growth at the time of the freeze, as well as the intensity and duration of the cold. It should be noted, however, that, so far as known, the effects of low temperature, except spikelet sterility, are observable immediately or soon after freeze occurs and not six weeks later. Furthermore, the symptoms ascribed to latent frost damage can more logically be attributed to other factors.

The writer, therefore, is of the opinion that neither root exhaustion nor latent frost damage was of primary importance. It seems more reasonable to attribute deterioration to a combination of unfavorable factors. These are listed below, approximately in the order in which they occurred. Many of the ideas presented here are not original with the writer but have developed after discussions and correspondence with other workers in the area.

1. Deficient soil moisture in the western half of Kansas. This factor is the cumulative effect of several years of subnormal rainfall in the area. Much winter wheat was sown on soil with two feet, or less, of subsoil moisture.

2. Shallow rooting as the result of the above factor.

3. Too much top growth in the fall of 1937 for the soil moisture available.

4. A mild open winter during much of which wheat continued to grow.

5. Extremely mild weather in February and March during which winter wheat came out of dormancy and made far too much top growth. The limited moisture in the soil was rapidly depleted during April, at which time it appeared that harvest would be fully two weeks earlier than usual.

6. Frost damage resulting from periods of low temperature on April 2, 7-8, and May 8. This was mostly reflected in killed tillers, damaged foliage, failure to head, partial sterility of the heads caused by failure of some florets to set seed, and blasting of the tips of the spikes. The latter seems to have been principally the result of the May 8 frost.

7. Extremely heavy infections of leaf rust. Leaf rust appeared at Manhattan on April 13, almost exactly a month earlier than normal. It was equally early elsewhere and by June 1 most of the wheat in the State was heavily infected. The disease developed into one of the heaviest epidemics ever observed throughout the entire western Mississippi Valley area. Most of the wheat in central Oklahoma and Kansas was defoliated by leaf rust shortly after heading. At Manhatton, the straw of many leaf-rust-susceptible wheats buckled at the uppermost nodes a few days before harvest. At Lincoln, Nebraska, leaf-rust infection was so heavy that the heads of some very susceptible strains failed to emerge from the boot. At least a part of the failure of plants to head in central Oklahoma and south-central Kansas, and part of the buckling of the straw, should be assigned to heavy leaf-rust

infection. It has been demonstrated in controlled experiments at Manhattan that a heavy leaf-rust infection which suddenly reduces the leaf area of a wheat plant results in a corresponding reduction in root area. Many of the finer roots die and even the remaining coarse roots are discolored. Part of the "root exhaustion" reported, therefore, may have been the result of the unusually heavy infections of leaf rust. It is estimated that the average loss from leaf rust in Kansas in 1938 was about 15 percent, but in south-central counties the yield of many fields undoubtedly was lowered 25 percent.

8. Excess rainfall during May and June, resulting in "wet feet" in general, especially in south-central Kansas, and in the actual drowning of large acreages in the form of spots where there was standing water.

9. The development of glume blotch (Septoria nodorum), black chaff, foot-rots, and other diseases favored by abundant moisture. Dr. D. B. Creager, of the Kansas Agricultural Experiment Station, pointed out in June that many of the discolored and constricted nodes on plants from southern Kansas bore fruiting bodies of glume blotch. Later he observed that there was considerable correlation between the abundance of nodal infections of glume blotch and the amount of buckled straw. It seems, therefore, that at least a part of the deterioration of the straw was due to unusually heavy infections of glume blotch. Black chaff and the various foot-rot organisms doubtless also contributed to the decline of the crop.

10. The wide distribution of Blackhull and Early Blackhull in the western half of the State, and especially in south-central counties. This factor probably should have been placed higher in the list of factors, for it undoubtedly is one of the most important ones. Throughout Oklahoma and Kansas, Blackhull and Early Blackhull slumped badly, whereas newer improved varieties, grown in adjacent fields, stood up better and gave far better yields. It cannot truthfully be said that it was the weak-strawed wheats that slumped, because Kanred, a notoriously weak-strawed variety, did not show the severe buckling of the straw so commonly seen in Early Blackhull and Blackhull. After many observations, one is forced to conclude that there are inherent differences in varieties of wheat in their reaction to the series of unfavorable factors, aside from weakness of straw as such.

11. Heavy stem-rust infection in some fields just before harvest. Stem rust appeared in Kansas on May 11, which is about a month earlier than normal. It looked for a time as though the stage was set for another major epidemic. However, the night temperatures remained too low for heavy infection and rapid increase of stem rust during the remainder of May and the first week of June. Stem rust was present in nearly every field in the State by June 15, but the crop slumped from other causes very soon thereafter. Heavy losses were caused by stem-rust infection in susceptible soft wheat varieties in the three eastern ranges of counties. Infections were moderate to light, and only slight damage was caused by stem rust in the central area. Unusually heavy stem-rust infections developed in the western third of the State after June 15 and the late wheat in that area seemed in danger of destruction. However, temperatures rose rapidly during the last few days of June, and the already fading crop finished rapidly. The plants died and dried up so rapidly that stem rust had no chance to exert its full influence.

Hazards Affecting the Western Kansas Wheat Crop

By A. F. Swanson,
Fort Hays Experiment Station, Hays, Kans.

Rarely has a wheat crop in Kansas been subjected to so many hazards on so many fronts in a single season as was true in 1938. Never was the outcome of the crop more difficult to predict or of greater concern to the producers as well as to the trade. Disappointment in yield and quality was the greatest where the prospects seemed best early in the season. The crop in the northwestern quarter of the State gave surprisingly good yields and quality, considering the prospects at the time of seeding.

The chief factors in determining the 1938 Kansas wheat crop were: A none too plentiful supply of stored moisture at seeding time except in localized areas; a sudden drop to zero temperatures early in December after a period of unseasonably high fall temperatures which cut short the early winter growth so highly desirable in the development of a strong root system; early emergence in the spring; high April rainfall, which overstimulated tillering in a large region of the State, followed by excessive May rains resulting in tall growth, papery weak straw, poor root anchorage, wet-weather diseases, breaking over and lodging, low yields and low test weight; the predominant use of Blackhull wheat, which apparently is not tolerant during its fruiting period to water-logged soil; unseasonable May 8 frost injury; and insect damage. Except for the drought at seeding time the above-mentioned hazards were either absent or less pronounced in the western third of the State, where wheat of high yield and quality was produced.

An especially unusual feature of the season at Hays was the prevalence of leaf and stem rust. Leaf rust appeared May 5 and by May 20 leaves of susceptible varieties were almost completely covered. Stem rust appeared June 1 and was quite general a week later. Cool weather until about June 20 held this rust in check but after that date it developed sufficiently to reduce the yield of susceptible varieties approximately 50 percent.

There was also much discussion of frost damage. At Hays, there were two spring freezes, one early in April when the temperature dropped to 19° F. and the other on May 8 when the temperature dropped to 28° F. At the time of the first freeze the wheat was 8 to 10 inches high but the low temperature was accompanied by wet snow, which protected the plants. So far as could be determined by observations the April freeze caused no permanent damage to wheat at Hays. Nor was any damage apparent in south-central Kansas, as observed by the writer in the period between April 17 and May 24. The May 8 freeze killed a large percentage of the pollen in certain early and midseason varieties. Some fields of Early Blackhull, for example, were completely sterile and in Tenmarq as much as 35 percent of the florets were sterile in some cases.

Damage from the May freeze was largely confined to an oval-shaped region bounded by Meade, Gove, Osborn, and Barton counties. Ellis and Ness counties probably suffered the most severe losses.

The 1938 Nebraska Wheat Crop

By K. S. Quisenberry,
Agricultural Experiment Station, Lincoln, Nebr.

Conditions for seeding winter wheat in the fall of 1937 were very poor at Lincoln and in most of eastern Nebraska. Because of the drought, seedbeds were poorly prepared and seeding was done in dry soil or delayed several weeks to await moisture and lessened grasshopper hazard. Wheat that came up early was badly damaged by grasshoppers, making reseeding necessary in some cases. The varietal plots at Lincoln were not seeded until October 17, when some moisture was obtained, and the plants did not emerge until October 29. Fairly good growth took place until about the middle of November when the temperature dropped to 12° F. This freeze hurt the plants for, as yet, there was little or no stooling.

The winter was fairly open and dry. The plots and farmers' fields made so little growth that the land looked bare all winter. Growth started early in March with warm weather and moisture and continued until early April, when a severe sleet and snow storm occurred. This storm checked growth and caused some leaf injury. During April the weather was warm and showers were frequent, causing rapid growth and stooling. A cold spell in early May again checked growth and caused some leaf injury. By the middle of May an early harvest was predicted but the weather turned cooler, delaying maturity. Early in June the moisture supply ran low and, with the heavy straw growth, drought effects soon began to show in the immediate vicinity of Lincoln. In southeastern Nebraska there was more moisture and the crop lodged rather badly.

Leaf rust was found at Lincoln on May 3 and spread rapidly. The epidemic became extremely heavy all over the State and in some cases prevente the crop from heading normally. Stem rust was found on May 30 and in the eastern part of the State and in some areas farther west caused considerable loss. Storms of early June caused considerable lodging. Whether because of rust, foot-rot, Septoria, hot weather, freezes, or other causes straw was very weak and brittle. High winds caused considerable straw breaking just before the crop was cut, making harvest very difficult. In isolated areas hail did much damage, as did grasshoppers.

In western Nebraska wheat made a very satisfactory fall growth, came through the winter in fine shape, and a big crop seemed certain. Spring drought, however, reduced the yields in many areas. Just north of Alliance, stem rust was rather heavy on winter wheat and very heavy on spring varieties

As soon as harvest started in the eastern part of the State, it was apparent that yield predictions were too high. Too many fields had "40 to 50 bushels of straw and 10 bushels of grain." Test weights were very low and color was poor. Some fields were so poor as to be hardly worth harvesting. Moving westward in the State both yields and test weights became better. At McCook, 57 to 58 pound wheat was common and at Sidney and Dalton many samples tested 60 to 62 pounds per bushel.

At no time did it seem that the 1938 crop was safe. Off to a bad start in the fall, and coming through the winter in only fair shape, it was clear that much rain would be needed to finish the crop, as there was no subsoil moisture. Where this rain was not received, the crop was injured by drought and where it did come, rust entered the picture. With so many hazards the surprising thing is that Nebraska produced so much wheat, and not that the crop is below expectations. All spring the crop looked much better than it really was, and the tall and heavy straw growth caused estimates of yield to be too high.

The Wheat Crop in North Dakota in 1938

By Ralph W. Smith,
Dickinson Substation, Dickinson, N. Dak.

The wheat crop of 1938 in this region has been affected by several unusual conditions. The soil was unusually dry until the middle of May, after which rains were frequent and abundant until July 6. During this period about 10 inches of rain fell, which is about twice the usual amount. This produced a heavy growth of straw, and by July 1 the wheat prospect was the best in many years, except that leaf rust was very abundant and stem rust was becoming increasingly so. Wet weather during the first week of July favored the rapid development of stem rust and now (July 25) one of the worst epidemics ever observed in this region is present. Add to this the worst infestation of grasshoppers ever known in this area, and it seems likely that most of the Marquis and Ceres wheat in this region will not be worth harvesting and threshing. A small percentage of the crop is Thatcher which, being damaged less by hoppers and much less by rust than the other varieties, will give a fair yield. Local small areas have been injured by hail as usual.

At the Substation wheat varieties were cut green to save some of the crop, but even then many of the heads were cut off by the hoppers. Rust-susceptible varieties showed greater loss but, in both rust-susceptible and resistant varieties, the hoppers showed a preference for certain varieties, especially Reward, Canus, and Reliance, and hybrids having these varieties in the parentage. Black chaff is unusually abundant this year, being noticeable on a majority of the varieties.

The 1938 Wheat Crop in Montana

By R. H. Bamberg,
Montana Agricultural Experiment Station, Bozeman, Mont.

At Bozeman, winter wheats came through the winter with little or no winter-killing and made very rank early growth. Soon after heading, some varieties began to lodge and at the present time (August 1) all varieties in nursery rows and field plots are practically flat. On the dry-land benches north of Bozeman, winter wheat is maturing with prospects of very high yields. Some fields should have 50 bushels and most areas well over 20. Some fields o. this area will have high percentages of dwarf smut, averaging at least 20 percent for large fields, and small spots running as high as 75 percent infection.

Spring grains were seeded very late on the Station, the earliest seeding being the bunt nurseries on May 5, 7, and 9. Spring wheat yield nurseries were seeded May 14 and 16 but the plots could not be put in until the 28th. Unless an early frost comes, most varieties should ripen before there is much danger of frost injury. All spring grains on the Station look well now and have not lodged even after irrigation.

At Moccasin, the field plots of all grains will have excellent yields and the crops of that area will be good, except for local areas, where hail damage is a factor. Grasshoppers are abundant but will not do much damage unless greater numbers migrate into the Basin. Winter wheat, spring wheat, oat, and barley nurseries are uniformly good, except for rather thin but uniform stands in spring wheats. Winter wheat harvest has just started.

At Havre, the plots and nurseries are the best in many years. Winter wheats are harvested and other grains ripening fast. Grasshoppers have done little damage, but Says plant bug is puncturing much of the spring wheat and other spring grains. In some plots the infestation is heavy enough to provide more than one bug for each culm.

Several reports have reached the station of late spring frost injury to winter wheats while still in the boot in certain areas around Great Falls and Cutbank. Temperatures of 28° to 30° were recorded about June 9 and 10. The winter wheats headed out about two weeks after this and, in parts of some fields, the upper half of many heads were completely dead as if the frost was severe enough to kill the developing head but had not hurt the leaves. Recently some samples were sent in from Cutbank that had fully developed heads but the upper one-third to two-thirds contained only a few berries. However, this type of injury apparently was confined to a few localities, as only one field containing heads so damaged were observed during a drive from Great Falls up to Shelby and back to Havre. In general, the winter wheat over the parts of the State represented by the Judith Basin, Great Falls, and Miles City areas, is very good except for some drought areas near Miles City.

Spring wheats in some fields between Great Falls and Shelby, and between Shelby and Havre, were injured considerably by hot winds on July 22 and 23, but rain came in that area on the 24th and 25th, so that one-half the fields or more will apparently make good heavy wheat. Poorly-prepared seedbeds probably are responsible for many of the poorer fields, as some of the worst fields observed were drilled in on stubble.

Spring wheat was excellent in Hill County around Havre. There was relatively little heat injury and there was a good rain about July 23. Wheat at this date was mostly in the late dough stage.

Wheat in Daniels, Valley, Sheridan, and Roosevelt counties, the four northeastern counties, is very late. Only in Roosevelt county was much of it in the late dough stage on July 28 and 29, and some only in the milk stage. Moisture conditions were good, but rust undoubtedly will cause widespread damage in all four counties, except in the fields which were seeded very early. These early fields make up hardly more than 20 percent of the acreage. Many fields not farther along than mid-dough had 70 percent rust. Ceres will not be quite so hard-hit as Marquis, partly because it was somewhat more advanced in maturity. This variety probably constitutes at least one-third of the acreage in the above counties.

Grasshoppers apparently will cause considerable damage in the northeastern counties. Some late fields already had at least one hopper per culm and local observers reported as high as 10 per culm in some fields.

Farther south in Richland County, around Sidney, destruction of some wheat fields by hoppers was almost complete. In some cases, 95 percent of the heads had been cut off and, in much of the area, the damage was more than 50 percent by actual count by the County Agent. Toward Glendive and Miles City, there were few grasshoppers, but there will be some very light yields because of drought.

Although heat, rust, and grasshoppers will reduce yields greatly in some areas, the State as a whole should have one of its biggest wheat crops, though perhaps somewhat smaller than the present official estimate.

Pendleton Field Station, Pendleton, Oreg.

J. Foster Martin, August 8, 1938.

The crop year 1937-38 was distinguished by several factors. There was a shortage of moisture at seeding time and as a result initial plant emergence was decidedly erratic. Subsequent rains and warm temperatures, however, resulted in the eventual production of excellent stands. The winter was sufficiently mild so that no injury from cold was apparent even in nonhardy varieties. Ample precipitation and warm weather during the spring stimulated tillering and produced an excessive growth of straw. Time of maturity played a very important part in that hot weather during the flowering period blighted many florets; there were only two kernels per spikelet in many fields. For this reason yields in general were lower than appearances indicated. Stripe rust was prevalent in susceptible varieties but did not materially lower production. In general, yields were about average and the grain is plump and of good quality.

Agricultural Experiment Station, Corvallis, Oreg.

Roderick Sprague, August 11, 1938.

The reader is referred to Dr. Sprague's report in the Cereal Courier vol. 30, no. 11, p. 95. July 25, 1938.

Agricultural Experiment Station, Logan, Utah

R. W. Woodward, August 2, 1938.

Seedbeds and moisture relationships during the fall of 1937 were generally satisfactory for seeding and emergence of winter wheat in Utah. Most of the grain made a good growth before cold weather set in. Both the fall and winter months were unusually mild with practically no snow remaining on the ground more than a few days at most. Warm rains in October, November, and December totaled 5.71 inches. January was slightly below normal but the remaining months were above normal in precipitation. Not until March 22 did any minimum temperature fall below 7° F. On that date a low of -4° F. broke all spring records since data were first available at the Experiment Farm. In general, the spring months were cold and wet with only occasional sunny days. Winter wheat, however, made abundant growth throughout the spring and early summer with surprisingly little disease. Spring grains, on the contrary, were seriously attacked by stem rust and mildew. It appears that winter wheat ripened just at the time rust made its appearance in the spring grains and thus escaped injury.

With the apparent high yields of winter wheat the few available tests indicate a rather low protein content. Cereal chemists are somewhat concerned over the matter of meeting previous standards should the condition be general.

Only a few fields show any appreciable amount of bunt. This is largely due to the growing of resistant varieties on the greater number of the dry farms where smut has been a problem.

Harvesting is in full swing at this time and dry hot weather prevails. The season of 1937-38 can well be classed as one of the most favorable for the production of winter wheat in Utah despite its freakish nature. Yields of winter wheat are being reported from 25 to 60 bushels per acre.

University Farm, Davis, Calif.

C. A. Suneson, August 1, 1938.

The most notable condition associated with the production of the current cereal crop in the western region was a higher precipitation than has been received in several years. Thus in California, in the long, dry Tulare Lake bottoms 150,000 acres of cereals were drowned out; and in such recently dry areas in Sherman County, Oregon, the Big Bend section of Washington, western Montana, southern Idaho, and the dry lands of northern Utah there is promise of a comparatively good crop. Such a favorable growing environment might naturally be expected to encourage certain diseases. Interest in stem rust is perhaps most widespread, though serious damage from it this season will probably be confined to a couple of high producing, irrigated sections in California; to the isolated (by desert) valleys of Nevada and certain spring wheat sections contiguous to Pullman, Wash.; Bozeman, Mont.; and Logan, Utah. With reference to stem rust, the writer has been surprised to find that the epidemic as observed in the entire western region this year permits recognition of infection centers for a long period of time. It is not uncommon to find one or very few badly rusted plants in the center of a large field with pustule density grading out therefrom to a near zero. In California, stem rust overwintered in all sections of the State, but the subsequent environment was not favorable for its spread in sufficient quantity to do damage except as noted above.

Pathologists at Pullman call attention to the far greater density of rust adjacent to barberry bushes in that section. In this connection it is interesting that though there was considerable rust at Pullman, none was seen in the plots at Moscow, Idaho, further emphasizing the localization of the current epidemic.

Stripe rust was probably more severe in the Palouse area than at any time during the past 20 years. It is significant, so far as cereal production goes, that damage has been reduced materially through elimination of such susceptible varieties as Jones Fife. Many grasses in the Pullman nurseries were prevented from heading by stripe rust.

Leaf rust was quite generally distributed throughout the area but assumed real importance at only one station, namely, Sandpoint, Idaho. Other rusts were completely absent at that station, but leaf rust readings of 95 percent or more were recorded for many varieties.

Foot rots are getting back into the picture also. In the Montezuma Hills section of California 15,000 acres of wheat and barley were almost ruined by take-all. Other organisms of the foot-rot complex were reported from other sections of California, making this State really conscious of the importance of this complex of organisms for the first time. In the Willamette Valley, winter grains also suffered materially from take-all. Similarly, cercosporella was far more conspicuous than in recent years.

In the area from Pendleton to Sandpoint mildew on wheat was unusually abundant. The varieties Federation and Rex were conspicuously susceptible.

Bunt is apparently on the decrease throughout the Northwest, judged by numerous inspections of farm fields. This has, no doubt, been brought about in part through the introduction of numerous resistant varieties. Results at numerous stations suggest that soil infection was something of a factor this year.

Despite the favorable moisture conditions prevailing throughout the area, lodging will probably not be more serious than common.

There was no winter-killing in the area during the winter, Federation surviving 100 percent at Lind, Wash. Frost damage prior to, or at heading time, is generally encountered somewhere in the region each year, but no example of it was seen this season.

Insects were less of a factor than usual, notably hessian flay in California and in the Willamette Valley, wire worms at Prosser, Wash., and grasshoppers at various points.

The so-called low smut continues to be a serious menace to production in certain areas, notably the Bench Land of the Gallatin Valley and the southern Idaho-northern Utah dry lands. Susceptible varieties in those areas show from 60 to 90 percent smut. Several resistant varieties, notably Relief, are available but, unfortunately, are not entirely satisfactory agronomically.

Agricultural Experiment Station, Pullman, Wash.

C. S. Holton, August 17, 1938.

The reader is referred to the report by Mr. O. A. Vogel in the Cereal Courier vol. 50, no. 12, p. 109. August 10, 1938.

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C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 September 10, 1938 No. 14

Personnel (Aug. 26-Sept. 10) and Field Station (Aug.16-31)

PERSONNEL ITEMS

Final bacterial wilt records for 1938 from cooperative field plots of Golden Bantam sweet corn in New York, on Long Island, and in Pennsylvania were taken the latter part of August by Dr. Charlotte Elliott.

At Geneva, N. Y., as in 1937, no wilt was found on early plantings up to the middle of July. By the 18th of August a few typical leaf lesions had developed. There were, however, only about a third as many infections as were observed in 1937. While a few Chaetocnema pulicaria were collected in 1937 none of these beetles was found this year, although their feeding injuries were observed on the corn leaves.

At Yonkers, N. Y., where only one planting was available, the wilt situation was apparently about the same as in 1937. No attempt was made to collect C. pulicaria there in 1937. This past season, while C. pulicaria were fairly abundant in the middle of July, there were very few in the plots by the 17th of August.

On Long Island (Hempstead) wilt was much more abundant in the first planting (May 15) than in the two previous years. By the middle of August, however, wilt in later plantings of susceptible varieties was not so abundant as in 1937. No attempt was made to collect C. pulicaria in 1937. In 1938 rain prevented collections on June 27. On July 15 these beetles were fairly abundant but by the middle of August they were much more difficult to find.

At Arendtsville, Pa., conditions were similar to those on Long Island. There was more infection in early than in late plantings and while C. pulicaria were abundant July 20 they were not abundant on August 14 and by the 29th of August comparatively few beetles could be collected.

In most seasons wilt increases in severity as the season advances and as far as the writer knows there is usually a similar increase in numbers of C. pulicaria.

Dr. M. M. Rhoades and Dr. L. J. Stadler attended the summer meeting of the Genetics Society at Woods Hole, Mass., September 1 to 6.

UNITED STATES DEPARTMENT OF AGRICULTURE

Office of Director of Personnel

Washington, D. C.

August 19, 1938

Personnel Circular No. 69

STATUS OF CIVILIAN OFFICERS AND EMPLOYEES OF THE FEDERAL GOVERNMENT WHO ACCEPT ACTIVE DUTY STATUS WITH THE CIVILIAN CONSERVATION CORPS AS MEMBERS OF THE OFFICERS' RESERVE CORPS OF THE ARMY

The Acting Comptroller General, in a decision to the Farm Credit Administration under date of July 28, 1938 (A-96323), ruled that employees of the United States Government who are members of the Officers' Reserve Corps of the Army may, within the discretion of the administrative office concerned, be furloughed without pay during the period they are on active duty with the Civilian Conservation Corps.

Active duty of a Reserve officer of the Army with the Civilian Conservation Corps is not duty with troops or at field exercises or for instruction, and may not be considered as military leave of absence with pay.

If the combined rate of compensation in the civilian position and active duty pay as a Reserve officer exceeds $2000 per annum, the dual compensation statute of 1916 would preclude both payments during the same period, even during any period the employee might be granted annual leave of absence with pay from his civilian position.

If furlough without pay be granted an employee to permit him to serve with the Civilian Conservation Corps on active duty as a member of the Officers' Reserve Corps of the Army, such furlough or leave without pay being in effect a separation from or a break in service, any accrued unused annual leave at the time of furlough or leave is granted must be regarded as forfeited.

(Signed) B. Gladman
Acting Director of Personnel.

UNITED STATES DEPARTMENT OF AGRICULTURE
Office of Budget and Finance
Washington, D. C.

August 26, 1938

BUDGET AND FINANCE CIRCULAR NO. 94

Contracts for Rental of Adding and Calculating Machines During Fiscal Year 1939; Application of Accrued Rentals to Purchase of New Equipment.

To facilitate seasonal or temporary work requiring the use of adding and calculating machines the Division of Purchase, Sales and Traffic has negotiated the following contracts for furnishing such machines to the Department throughout the continental United States on a rental basis during the fiscal year 1939. The Division will furnish bureaus copies of these contracts upon request.

Number	Contractor	Kind of Machine
Als-17 517	Monroe Calculating Machine Company, Inc.	Calculating machines, adding machines, hand and electric.
Als-17618	Burroughs Adding Machine Company	Key-driven calculators, adding machines, hand and electric.
Als-17619	Victor Adding Machine Company	Adding machines, hand and electric.
Als-17620	Remington Rand, Inc. (Adding-Bookkeeping Machine Division)	Adding machines, hand and electric.
Als-17621	Marchant Calculating Machine Company	Calculating machines, electric.
Als-17622	Felt & Tarrant Manufacturing Company	Calculating machines, hand operated. (Comptometer model).
Als-17623	Underwood Elliott Fisher Company	Adding machines, hand and electric.

In addition to the rental feature the contracts provide for the application of rental payments on the purchase price of similar new equipment if purchased within a specified time. For the past several years similar contracts were entered into on behalf of the Department, but participation by the several Departmental agencies was not sufficiently coordinated to afford the Department the full benefit of the rental-purchase conversion privilege. To insure that end during the present year, the current contracts provide for the placement of all rental orders through the Central Supply Section. That Section will maintain current records of rental accruals available, and upon request by any bureau will place purchase orders for new machines, making proper deductions for such accrued rental allowances as may not be required by the renting agency.

(Signed) H. A. Nelsen
Assistant Director of Finance.

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

LOUISIANA

RICE EXPERIMENT STATION, CROWLEY (Rice Agronomy, J. M. Jenkins) [Sept. 2]

Temperatures during August were about normal. The maximum was 96° on the 27th and the minimum 69°; the average mean was 82°.

The total precipitation of 6.27 inches is 2.10 inches more than in 1937 and 0.94 inch more than the 28-year average for August. Of the total monthly precipitation 4.28 inches were recorded during the period from August 13 to 15, when a tropical hurricane was approaching and passing through southwestern Louisiana. The center of the storm passed within 40 or 50 miles west of Crowley. At points 12 to 18 miles west of Crowley the precipitation for the period of the hurricane was unofficially reported as much as 9 to 13 inches.

There was very little damage to the rice crop from the tropical hurricane. While the wind was reported to have reached a velocity of 50 miles per hour in the vicinity of Lake Charles, it did not cause much damage to rice, because the crop in that section was not far enough advanced in growth. Farther east, where the wind was not so strong but where the rice crop was more advanced some damage was caused by the wind bruising the young spikelets on the panicles. In certain localities adjacent to streams, there were rather heavy losses from back-water submerging mature and shocked fields of early rice.

By the end of August nearly all of the commercial crop of early rice had been threshed, and a few fields of midseason varieties had been cut.

It is interesting to note that the water level in the deep well on the Station used for irrigation purposes had risen on August 30 to a point sufficiently high to permit pumping without first having to "prime" the pump. In no other year since 1923 has the water level in the deep well reached this height before November or December.

On August 19 the Station was visited by a group including the Directors of the agricultural experiment stations of the Southeastern States. In this group were: Dr. M. J. Funchess, Alabama; Dr. C. T. Dowell, Louisiana; Dr. Clarence Dorman, Mississippi; Dr. I. O. Schaub, North Carolina; Dr. H. P. Cooper, South Carolina; Dr. A. W. Drinkard, Jr., Virginia; and Mr. R. W. Trullinger, of the Office of Experiment Stations, Washington, D. C.

On August 30 we had the pleasure of a visit from Dr. Eugene C. Auchter, Chief of the Bureau of Plant Industry, and Dr. W. H. Barre, in charge of the Division of Cotton and other Fiber Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture. We especially appreciate Dr. Auchter's visit, for he is the first Chief of the Bureau of Plant Industry to visit this Station.

TEXAS

TEXAS SUBSTATION NO. 6, DENTON (Wheat Improvement, I. M. Atkins) [Sept. 1]

The weather in August was unfavorable for crop growth and for the preparation of land for fall-sown small grains. There was no precipitation; the normal precipitation for August is 2.55 inches. During the latter half of the month temperatures were above normal, the maximum being above 99°. The mean temperature for the month was 85.9°, or 1.9° above normal.

All yields for the 1938 season have been compiled and the 1938 annual report is nearly completed. Seeding plans are nearly complete and part of the seed for fall seeding has been put up.

Mr. David Reid, who has recently received his Master's degree from the University of Minnesota, has been appointed by the Texas Agricultural Experiment Station to take over the winter wheat experiments in the Texas Panhandle. He will be stationed at Amarillo and will cooperate with the Soil Conservation Service, the experiments being seeded on the new experiment station near Bushland, some 13 miles west of Amarillo. The writer, together with Dr. P. C. Mangelsdorf and Mr. Reid, were at Amarillo from August 6 to 10 making plans for the new work.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Grain Sorghum and Broomcorn, J. B. Sieglinger) [Sept. 2]

During the last half of August the sorghums and broomcorn made good growth and development, but as no rain occurred during the period the growing crops are depleting the moisture supply. A number of the earlier varieties of the first date in the date-of-seeding experiment have matured and dried ripe suddenly and it was necessary to harvest them because of lodging.

The drying, together with normal summer heat, has stopped the rapid heading of the later sorghums, and bagging of seed heads has caught up with heading. During the heat of the day most sorghums curl but recover by the following morning.

Already better crops are made than in the past five years, but as usual rain would be welcomed.

The maximum temperature for the last half of August was 102° on the 25th and 29th, and the minimum 65° on the 21st. There was no precipitation. The total for August is 1.45 inches.

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) [Sept. 1]

Preparation of the 1938-39 nursery seeding plans and packeting of seed is in progress.

The ground for the 1939 nursery and plots has had to be worked about every two weeks this summer, more to control soil blowing and to put the land in shape to readily absorb more rain than to eradicate weeds. Ample subsoil moisture is available even though the surface soil is powdery dry to a depth of about six inches.

August was relatively cool. Temperatures of 100° or over occurred on 15 days during the month as compared with 23 such days in August of 1937. A maximum of 103° was recorded on the 10th. The maximum in August 1937 was 114°. The minimum was 65° on the 15th and 20th. The mean was 86°. A total of 1.45 inches of rain fell during the month, all of which was recorded on August 14 and 15.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) [Sept. 1]

Very dry weather prevailed during the latter half of August. The maximum temperature was 100° and the minimum 42°. The precipitation was 0.11 inch.

Harvesting of the flax nursery material to be threshed in bulk is completed. Hybrid and selection material still remains to be harvested. There is considerable rust on some flax varieties.

Threshing of the flax nursery is now under way. Yields of varieties already threshed in the advance nursery range from just under 6 bushels per acre to over 13 bushels. Some of the best strains still remaining to be threshed probably will average considerably higher.

Average acre yields and test weights from the flax varietal plots are presented in the following table. Poor stands, especially of the smaller seeded varieties, a heavy growth of weeds, and severe grasshopper damage in all plots account for the low yields in this season of fairly favorable moisture conditions.

Yield and test weight of 22 flax varieties grown in triplicate 66th-acre plots at Mandan, N. Dak., 1938.

Variety	C. I. No.	Test weight (Lbs. per bu.)	Average yield (Bu. per acre)
Bolley Golden	644	52.8	8.2
Walsh	645	51.8	8.0
New Golden	735	53.0	7.4
Rio	280	52.5	7.1
Bison (sown without press wheel)	389	53.2	6.9
Hybrid 160 x 179	496	53.2	6.6
Do	745	54.2	6.5
Natural Hybrid of C. I. 161	820	53.3	6.3
Redwing	499	54.5	6.2
Bison (sown with press wheel)	389	53.8	5.9
Redwing Natural Hybrid (N. N. 34121)	----	54.5	5.6
Smoky Golden	----	52.2	5.6
Hybrid 10-2-59-3	739	52.3	4.8
Natural Hybrid of C. I. 161	744	53.2	4.6
Argentine selection 1-25-70	764	54.2	4.5
Selection of C. I. 385 (N. N. 34175)	----	53.0	4.5
Sib 206	473	54.0	4.5
Linota	244	54.5	4.4
Argentine selection 1-25-70 (N. N. 34148)	----	54.5	4.3
Buda selection	737	54.3	4.1
Buda	326	54.3	4.0
Buda x (19 x 112)	742	54.5	3.6

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) [Sept. 1]

The month of August has continued rather dry. There were only light showers, totaling 0.82 inch of precipitation. Temperatures have been nearly normal with a maximum of 99° and a minimum of 38°.

Threshing of cereal crops is completed. The cleaning and storing of seed and the computing of yields and assembling of data are in progress.

Farmers are showing considerable interest in rust-resistant wheat varieties and seed of such varieties will be in demand for next spring's seeding.

Grasshoppers apparently are not so thick as at this time last year, but probably enough eggs are being laid to make them a factor affecting crop yields next year.

The yields and some other data from the regional nursery and field plots of spring wheat are presented below. Yields were reduced considerably by grasshoppers cutting off the heads, and both yields and test weights were further reduced by the need for cutting the crop while still green to save as much as possible from the hoppers. The notes on both leaf and stem rust show that all of the other varieties in the regional nursery and several in the field plots showed less rust than did Ceres and even Thatcher. In general, the rust-susceptible varieties showed a higher percentage of heads cut off by hoppers than the rust-resistant varieties, making a wider yield advantage than usual in favor of the rust-resistant varieties.

Yield and other agronomic data on spring wheat varieties grown in three triplicated 16-ft. rows in the uniform regional nursery at Dickinson, N. Dak., 1938[1]

Variety	Nurs. No.	Yield (Bu. per A.)	Test weight (Lbs. per bu.)	Rust Leaf (Pct.)	Rust Stem (Pct.)
H-44 x Ceres	1348	27.5	55.0	1.0	T
Hope x Ceres (C. I. 11428)	1098-28	26.8	55.0	T	0.3
625 x Ceres x Hope-Florence	2746	25.7	57.0	T	T
H-44 x Marquis	1552-9B	24.8	55.0	T	T
625 x Ceres x Hope-Florence	2748	24.3	56.0	0.7	T
Ceres x Hope-Florence	2592	23.1	57.0	5.0	T
H-44 x Marquis	1517	22.5	59.0	T	T
Hope x Ceres	S.D.1463	22.3	58.0	3.0	0.3
625 x Ceres x Hope-Florence	2743	20.8	54.5	T	T
H-44 x Thatcher	II-29-53	20.5	54.5	0.3	T
H-44 x Marquis	R.L. 704.1	20.5	57.0	0.3	T
Do	II-28-61	20.2	57.0	2.0	T
H-44 x Ceres	1344-B	19.8	56.0	T	T
Do	1349	19.3	52.5	0.3	T
H-44 x Thatcher	II-29-52	19.3	55.0	0.3	T
H-44 x D. C.	II-28-27	18.0	56.5	T	T
Reliance x Hope	1248	17.8	53.0	2.0	T
Thatcher (C. I. 10003)	----	17.2	56.0	23.0	8.0
H-44 x Reward	R.L. 975.1	17.2	56.0	0.7	T
625 x (Ceres x Hope-Florence)	2811	15.1	57.0	T	T
H-44 x Thatcher	II-29-49	14.7	57.0	2.0	T
Reliance x N. N. 1110	1330	12.8	55.0	0.3	T
Do	1329	11.2	52.5	0.3	T
H-44 x Reward	1097	9.1	57.0	0.7	0.7
Ceres (C. I. 6900)	----	6.6	49.0	10.0	68.0

1/ Yield and test weight reduced somewhat by cutting green to save from grasshoppers.

Yield and other agronomic data on spring wheat varieties grown in four plots at Dickinson, N. Dak., 1938[1]

Variety	C.I. No.	Nurs. No.	Yield (Bu. per A.)	Rust Leaf (Pct.)	Rust Stem (Pct.)	Estimated Hopper injury (Pct.)
Ceres x Hope-Florence	11712	2592	13.6	5	T	19
625 x (Ceres x Hope-Florence)	-----	2791	11.8	T	0	18
Ceres x H-44	-----	1344	11.3	2	0	17
Do	-----	1348	11.1	8	0	11
Ceres x Hope-Florence	-----	2740	11.0	T	T	24
Ceres x H-44	-----	1349	10.2	1	0	16
Hope x Ceres	-----	1098-B	8.5	10	4	22
Do	-----	1098	8.4	2	4	22
Ceres x Hope-Florence	-----	2634	8.4	T	3	29
Carleeds	11801	-----	6.9	25	T	20
Apex	11636	-----	5.5	15	5	24
Thatcher	10003	-----	4.8	25	2	60
Ceres	6900	-----	3.0	15	75	34
Renown	11709	-----	1.0	8	T	84
Marquis	3641	-----	0.4	25	85	68
Haynes Bluestem	2874	-----	0.4	30	95	53
Reward	8182	-----	0.2	30	60	95
Red Fife	3329	-----	0.2	30	90	63
Canus	11637	-----	0.2	40	85	89
Reliance	7370	-----	0.1	15	85	76

Yield and other agronomic data on spring wheat varieties grown in four plots at Dickinson, N. Dak., 1938 1/ (Continued)

Variety	C.I. No.	Nurs. No.	Yield	Rust		Estimated Hopper injury
				Leaf	Stem	
			(Bu. per A.)	(Pct.)	(Pct.)	(Pct.)
Durum						
Mindum	5296	-----	7.5	6	8	15
Pentad	3322	-----	6.0	T	T	25
Kubanka	1440	-----	5.5	2	5	15

1/ Test weight to be determined when seed is cleaned.

AGRICULTURAL EXPERIMENT STATION, FARGO (Flax Diseases, H. H. Flor) [Aug. 23]

The threshing of the quadruplicate rod-row plots of flax is finished. The following table shows the average germination of the center row of each plot and the average yield in bushels per acre. The small difference in yield of this entire set is quite remarkable. The low yield in Rio was undoubtedly due to the poor stand. The rust-resistant hybrids yielded considerably higher than Bison, which was 21st in a series of 37. It is interesting that the Argentine variety I. F. 810, obtained from Dr. Jose Vallega, was second in yield.

Yield of flax varieties and hybrids grown in quadruplicate 3-row plots on farm soil (moderately wilt infested) and on Plot 30 (thoroughly wilt infested) at the North Dakota Agricultural Experiment Station, Fargo, 1938.

Variety or hybrid	C. I. No.	On Farm soil		On Plot 30	
		Plants emerged per row	Yield	Plants emerged per row	Yield
		(No.)	(Bu. per A.)	(No.)	(Bu. per A.)
Varieties					
Bison	389	666	18.3	648	17.1
Buda	326	631	19.1	629	15.3
Do	499	640	17.3	612	15.0
Redwing	320	694	17.4	712	9.2
Rio	280	188	16.2	539	8.6
Bolley Golden	644	478	18.0	557	7.4
Linota	244	622	18.9	648	6.2
Argentine I. F. 810	868	750	19.9	---	-----
Mixture (4 varieties)	---	842	18.3	---	-----
Damont	3	696	2.8	---	-----
Hybrids	Nurs. No.				
Bison x Rio	30	585	20.5		
Do	469	572	19.0		
Do	23	543	18.8		
Do	16	589	18.7		
Do	2	449	18.6		
Do	114	569	18.4		
Do	43	745	18.2		
Do	15	633	18.2		
Rio x Bison	184	544	18.7		
Do	29	461	18.3		
Do	9	581	18.6		
Do	50	706	18.5		
Do	189	430	17.5		
Bison x Buda	28	900	19.6		
Do	48	818	18.2		
Do	44	542	18.0		
Bison x Buda (270)	1	426	18.1		
Do	4	467	17.1		

Yield of flax varieties and hybrids grown in quadruplicate 3-row plots on farm soil (moderately wilt infested) and on Plot 30 (thoroughly wilt infested) at the North Dakota Agricultural Experiment Station, Fargo, 1938. (Continued)

Variety or hybrid	Nurs. No.	On Farm soil		On Plot 30	
		Plants emerged per row (No.)	Yield (Bu. per A.)	Plants emerged per row (No.)	Yield (Bu. per A.)
Hybrids (Continued)					
Buda x Bison	40I	855	19.7		
Do	21	923	19.4		
Do	245	707	19.4		
Do	36	753	19.2		
Do	10A	726	19.0		
Do	20	984	17.6		
Do	10B	865	17.5		
Bison x Redwing (499)	45	813	18.0		
Redwing x Bison	47	503	18.7		

UTAH

AGRICULTURAL EXPERIMENT STATION, LOGAN (Cereal Agronomy, R. W. Woodward)
[Sept. 1]

Harvesting and threshing of small grains is nearly completed. Yields turned out well despite the heavy epidemic of stem rust. Winter wheats in the nursery trials ranged from 30 to 48 bushels per acre; spring wheats yielded from 50 to 70 bushels per acre; spring barleys ranged from 85 to 117 bushels; and oats yielded 140 to 160 bushels to the acre. It should be noted that the spring grains on the Experiment Farm were seeded relatively early and did much better than commercial fields, which were ravaged by rust.

Late seedings of wheat and barley showed considerable damage from stem rust, resulting in light shrunken kernels. Many of the strains from the Federation x Hope cross were highly resistant to the race of stem rust prevalent.

Corn has made excellent growth this season and promises high yields of both grain and silage. Little or no worm injury has been noted this year.

The temperatures in August were generally low as compared with past years. The mean temperature was 67°, as low as has been recorded at the Experiment Farm. The precipitation totaled 0.16 inch.

THE CEREAL DISEASE SITUATION IN THE PALOUSE REGION OF IDAHO AND ADJACENT AREAS IN 1938.

By Wayne M. Bever, Moscow, Idaho

Rusts (Puccinia sp.)

Meterological conditions during the fall and winter of 1937-38 in the Palouse and bordering areas were optimum for the development and accumulation of inoculum of the cereal rusts. The weather records show that no really low temperatures were experienced during the winter and early spring months. Temporatures were such that most rust hosts were probably in a physiological active state throughout the winter.

Stripe rust reached its maximum development about the middle of June which is approximately 3 weeks earlier than normal. The epidemic was the most severe ever observed by the writer. All susceptible grass hosts observed were literally covered with rust and in many instances were so badly damaged that they failed to head. In experimental plots susceptible wheat varieties such as Jones Fife, Fortyfold, and Federation had the leaves completely destroyed. The extent of the stripe rust epidemic in commercial wheat fields is not definitely known. The infection was severe in certain local areas while in others no infection was observed. Many commercial varieties are resistant to the race of stripe rust commonly found in this area.

Leaf rust (P. rubigo-vera tritici) was more prevalent than for the past several years. This rust appeared rather early in the season and spread quite rapidly for a time, but was slowed up by dry weather late in the season. At the Sandpoint substation infection was especially heavy on susceptible varieties such as Jenkin, Triplet, and Albit.

Stem rust (P. graminis tritici) was especially severe on susceptible varieties in the uniform spring wheat rust nursery and some damage occurred in commercial fields near barberry bushes. Heavy stands in the low lying sections of some fields near bushes were almost a complete loss. In general, in these same or neighboring fields where the altitude was somewhat higher and the air drainage better, little or no damage occurred. Several barberry hedges near Colfax, Wash., were literally covered with aecia and the low portions of wheat fields adjacent to them were heavily infected. Prior to June 12 uredial infection was extremely heavy, which was exceptionally early for stem rust infection. By the first week in July telia were so prevalent that the above mentioned fields appeared to be black.

Stem rust on spring barley was more prevalent than usual. Because of its late development it failed to reach epidemic proportions, only a trace having been recorded for the entire area.

Cercosporella Footrot of Wheat

Footrot was found in scattered sections throughout Nezperce and Camas prairie areas in Nezperce, Lewis, and Idaho counties on June 28. It was found in previously unreported areas but was most severe in the eastern portion of Lewis County near Nezperce, Idaho. It was estimated that one 800-acre field of Oro wheat would show a 30 to 40 percent loss. This field was visited again on July 22 by the writer, at which time the loss was estimated to be between 50 to 60 percent. Other fields in this particular section suffered considerable loss. No footrot was found in the Palouse area.

Bunt of Wheat (Tilletia sp.)

In the above mentioned areas from a trace to about 2 percent smut infection was observed in all the fields visited. In Latah County some fields were estimated to have 5 to 10 percent infection.

A trace of the "short smut" (T. tritici) was found near Winchester, Idaho. Near Mohler, Idaho, as much as 1 or 2 percent was found in some of the fields examined. This is much more than ever observed in this particular section and indicates that this smut is becoming more prevalent. "Short smut" was found in Latah County for the first time this year, one field of Mosida wheat showing a trace. No other infected fields were found, although a careful survey was made throughout the entire county. "Short smut" failed to appear near Plummer, Idaho, where it was found in abundance in 1936.

Frost and Heat Damage

In certain areas frost damage was very evident in the fall-sown wheats. On May 2, 3, 5, and 6, when much of the wheat was in the flowering stage, a minimum temperature of 32° was recorded. As a result, many white and sterile heads were found over the entire wheat-growing areas of Latah, Lewis, Nezperce, and Idaho counties. The damage was most severe in the swales and valleys; however, farmers brought in samples collected from higher areas showing frost damage. The extent of the damage could not be accurately estimated, but there was at least a trace.

Spring wheat in the vicinity of Moscow suffered considerably from lack of moisture in combination with high temperatures. The head size was reduced and considerable shriveling of the grain was noted in several fields. It was estimated that the yields were reduced approximately 15 to 20 percent.

More spring grain was seeded in Latah County this year than for the past several years.

Barley Covered Smut (U. hordei)

A larger acreage of Hannchen barley was grown in the Palouse and prairie regions than in all previous years in which the writer has had opportunity to make observations. No smut was found in the fields of Hannchen examined. A trace to about 15 percent was observed in some fields of Union Beardless. A trace was noted also in some fields of the White Winter variety.

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C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 September 25, 1938 No. 15

Personnel (Sept. 11-25) and Field Station (Sept. 1-15)

PERSONNEL ITEMS

Dr. B. B. Bayles and Dr. H. A. Rodenhiser spent September 6 and 7 at State College, Pa., to make arrangements with the Pennsylvania Agricultural Experiment Station for cooperative research on small grains.

Dr. A. G. Johnson, and Dr. O. A. Nelson, of the Bureau of Entomology and Plant Quarantine, were at Fayetteville, Tenn., on September 14 to study the commercial application of the chlorine seed treatment of wheat, oats, and barley. Dr. Johnson substituted for Mr. R. W. Leukel, who is temporarily indisposed.

Dr. M. A. McCall left Washington September 24 for a conference with personnel of the Division and officials of cooperating agricultural experiment stations in Kansas, Illinois, Indiana, and Ohio concerning the planning and conduct of cooperative research.

Dr. M. A. McCall and Dr. M. T. Jenkins, Dr. M. M. Rhoades and other members of the staff of corn investigators attended a corn conference at the Wisconsin Agricultural Experiment Station from September 14 to 17.

Dr. S. C. Salmon left Washington September 17 to inspect cooperative research work with weeds and to consult officials of State agricultural experiment stations in Iowa, Kansas, Nebraska, Minnesota, North Dakota, Montana, Washington, Idaho, Oregon, California, Nevada, and Utah regarding the weed research program. He will return to Washington about October 15.

Dr. G. A. Wiebe attended the annual meeting of the United States Maltsters Association at Milwaukee, Wis., on September 20.

RECENT PUBLICATIONS

H. M. Beachell, C. Roy Adair, N. E. Jodon, L. L. Davis, and Jenkin W. Jones. Extent of Natural Crossing in Rice. Jour. Amer. Soc. Agron. 30 (9): 743-753. September 1938. (Cooperative investigations conducted by the Division of Cereal Crops and Diseases and the Arkansas, Louisiana, Texas, and California agricultural experiment stations.)

G. H. Dungan, C. M. Woodworth, A. L. Lang, J. H. Bigger, and R. O. Snelling. Developments in Hybrid Corn Production. Ill. Farmers' Inst. [Bull.] 51 pp., 24 figs. [1938] (A cooperative project among the Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture, the Illinois State Natural History Survey, and the Illinois Agricultural Experiment Station.)

C. O. Johnston, C. L. Lefebvre, and E. D. Hansing. Kansas Mycological Notes, 1936. Kans. Acad. Sci. Trans. (1937) 40: 69-74. 1938. (Cooperative investigations by the Division of Cereal Crops and Diseases and the Kansas Agricultural Experiment Station.)

Jenkin W. Jones and C. Roy Adair. A "Lazy" Mutation in Rice. Jour. Heredity 29 (8): 315-318, figs. 14-16. August 1938. (Cooperative investigations of the Division of Cereal Crops and Diseases and the Arkansas Agricultural Experiment Station).

J. H. Martin, James F. Couch, and Reinhold R. Briese. Hydrocyanic Acid Content of Different Parts of the Sorghum Plant. Jour. Amer. Soc. Agron. 30 (9): 725-734, fig. 1. September 1938. (Cooperative investigations between the Division of Cereal Crops and Diseases, Bureau of Plant Industry, and the Pathological Division, Bureau of Animal Industry, U. S. Department of Agriculture.)

Roderick Sprague. Two Mastigosporium Leaf Spots on Gramineae. Jour. Agr. Research 57 (4): 287-299, figs. 1-5. August 15, 1938. (Cooperative investigations by the Division of Cereal Crops and Diseases and the Oregon and Washington agricultural experiment stations.)

C. A. Suneson and George L. Peltier. Effect of Weather Variants on Field Hardening of Winter Wheat. Jour. Amer. Soc. Agron. 30 (9): 769-778, fig. 1. September 1938. (Contribution from the Division of Cereal Crops and Diseases and the departments of agronomy and plant pathology of the Nebraska Agricultural Experiment Station.)

Swanson, A. F. "Weak Neck" in Sorghum. Jour. Amer. Soc. Agron. 30 (9): 720-724, fig. 1. September 1938. (Results of investigation conducted cooperatively by the Division of Cereal Crops and Diseases and the Kansas Agricultural Experiment Station, Manhattan, Kans., at the Fort Hays Branch Experiment Station, Hays, Kans.)

ADMINISTRATIVE NOTE

When unused portions of tickets are returned for credit, they must be accompanied by the following information:

Points between which ticket was used where travel was with Pullman service, and dates and hours of departure and arrival of trains.

Points between which ticket was used where travel was with coach service, and dates and hours of departure and arrival of trains.

(Signed) H. S. Smith
Junior Administrative
Assistant

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

KANSAS

FORT HAYS EXPERIMENT STATION, HAYS (Cereal Agronomy, A. F. Swanson) (Sept. 15)

The drought which extended from July 1 to August 13 was severe enough at Hays to cause a marked depreciation in the yield of sorghum for both grain and forage. The early varieties, such as Sooner, Early kalo, and Colby, will produce from 15 to 25 bushels. Midearly to late varieties will produce little or no grain. The yield of sorghum forage will be about a half crop, with the possibilities of the better varieties yielding as high as two tons. Corn failed to produce grain and generally less than one-half ton of fodder to the acre.

Wheat is being seeded extensively in the territory wherever local rains have fallen. Only on fallowed land are the prospects favorable for a satisfactory yield.

"Weak neck" a disease noted for the first time in sorghum last year is again in evidence at this Station. The disease attacks the peduncles, causing shriveled grain and later breaking-over of heads. The disease is most evident in certain milo hybrids and more severe in early than in late planting. The cause of the disease is not known but may be associated with alternate periods of drought and rainfall. Neither is it known of what economic importance the disease may prove to be.

Dr. E. C. Auchter, Chief of the Bureau of Plant Industry; Dr. C. E. Leighty, E. F. Chilcott, of the Division of Dry Land Agriculture; and Director L. E. Call of the Kansas Agricultural Experiment Station were recent station visitors. The station was also host on September 9 to 130 county agents and farmers from the territory in the interest of crop production.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (Sept. 15)

Rainfall above average during the first half of September compensated somewhat for the drought during August. An inch of rainfall occurred on the 5th and little field work could be done during the remainder of the week on account of wet weather. The maximum temperature was 93° on the 3rd and the minimum 38° on the 14th.

Harvesting of the safflower plots and flax nursery is completed but threshing of the safflower plots and much of the flax nursery still remains to be done.

Mr. Gilbert L. Wood, employed here as agent on the Cereal project since July 1, left Mandan September 12 to return to Texas to resume his studies at A. and M. College.

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (Sept. 17)

The seeding of winter wheat in field plots and nursery and winter rye in plots is completed. The ground has been so dry for several weeks that seed could not germinate. A few hoppers are still present but hardly as thick as last year at this time. A survey of the prevalence of grasshopper eggs over the State is being made and the results will be of much interest to everyone.

Corn varieties in plots and nursery have been harvested and shocked to dry out before husking. Many ears are but poorly filled due to hoppers eating into the silks at time of fertilization. No killing frost has yet occurred.

The following tables present the yields obtained from the quadruplicated field plots of oat and barley varieties grown in 1938.

Yield of oat varieties grown in quadruplicated 56th-acre field plots at the Dickinson Substation, 1938.

Variety	C. I. No.	Estimated loss from grasshoppers (Percent)	Yield 1/ (Bu. per acre)
Richland selection 52	3008	40	20.3
Gopher	2027	40	18.1
Kherson	459	45	17.7
Iogold	2329	40	17.1
Carleton	2378	45	16.9
Edkin	2330	45	14.7
Markton x Idamine	2954	50	14.0
Bannock	2592	60	12.4
Markton	2053	50	12.1
Rainbow	2345	50	12.1
Silvermine x Markton	2999	55	12.1
Swedish Select	134	55	11.0
Anthony	2143	60	8.9
Wayne	2567	60	8.4
Rusota	2343	50	6.9
Victory	560	75	4.1

1/ The varieties were cut green to save them from the hoppers. A small amount of rust was present on most varieties.

Yield of barley varieties grown in quadruplicated 56th-acre field plots at the Dickinson Substation, 1938.

Variety	C.I.No.	Estimated loss from grasshoppers (Percent)	Stem rust (Percent)	Yield (Bu. per A.)
Ezond	6265	63	15	20.6
Trebi	936	35	18	15.1
Colsess	2792	25	25	14.6
----	2752	50	20	11.6
Lion	923	33	18	10.6
----	2753	58	25	10.4
Composite Cross	5461	40	-	10.0
Manchuria	244	43	18	9.2
Wisconsin Pedigree 38	5105	53	20	7.7
Odessa	182	45	18	6.8
Steigum	907	85	18	6.1
Horn	926	73	15	4.2
Hannchen	531	85	15	2.9
Glabron	4577	85	20	2.0
Velvet	4252	75	20	1.8

OREGON

PENDLETON FIELD STATION, PENDLETON (Cereal Agronomy, J. F. Martin) (Sept. 15)

The weather remains warm and dry, although 0.12 inch of rain fell on September 7. There was no precipitation in August, and only 0.06 inch in July. Moisture is near the surface on fallowed soil, so half an inch of rain would provide a favorable seedbed for fall grain.

The accompanying tables present yields and weights per bushel for fall and spring grains grown in replicated field plots in 1938. Some of the later maturing varieties were better than usual, as they were able to take full advantage of a late June rain.

Average yield and weight per bushel of winter wheat varieties grown in four 53rd-acre plots at the Pendleton Field Station, 1938.

Variety	C.I.No.	Test weight (Lbs. per bu.)	Yield (Bu. per acre)
Jenkin	5177	60.7	46.4
Federation	4734	60.0	45.1
Rio	10061	63.5	45.1
Fortyfold x Federation	11693	59.3	44.5
Golden	10063	59.3	43.7
Turkey selection	11424	63.3	43.6
Rex selection M2	11690	60.7	43.5
Oro	8220	63.0	43.3
Hymar	11605	61.0	42.2
Rex	10065	61.2	42.1
Rex selection M1	11689	61.5	42.0
Triplet	5408	62.1	41.8
Kharkof	1442	62.2	41.8
Hybrid 128	4512	61.2	39.8
Albit	8275	60.2	38.5
Ridit	6703	62.5	38.5

Average yield and weight per bushel of spring wheat varieties grown in four 53rd-acre plots at the Pendleton Field Station, 1938.

Variety	C.I.No.	Test weight (Lbs. per bu.)	Yield (Bu. per acre)
Onas	6221	59.5	48.5
Federation x Bunyip selection 49	----	59.5	46.5
Sunset x Boadicea	11706	61.2	43.5
Baart	1697	62.1	42.8
White Federation	4981	61.3	41.4
Hard Federation 31	8255	62.1	41.3
Federation	4734	60.0	40.2
Federation x Bunyip selection 41	11874	59.5	40.0
Marquis	4158	60.7	38.4

Average yield and weight per bushel of spring barley varieties grown in four 53rd-acre plots at the Pendleton Field Station, 1938.

Variety	C.I. No.	Test weight (Lbs. per bu.)	Yield (Bu. per acre)
Flynn selection 37	5918	46.2	62.2
Trebi	936	48.0	55.1
Flynn selection 1	5911	47.2	50.9
Meloy selection 3	4656	46.3	48.7
Composite Cross selection	5449	44.3	48.6

Average yield and weight per bushel of spring oat varieties grown in four 53rd-acre plots at the Pendleton Field Station, 1938.

Variety	C.I. No.	Test weight (Lbs. per bu.)	Yield (Bu. per acre)
Sixty-Day x Markton	2352	34.8	78.3
Markton x Victory	2591	38.0	78.0
Markton	2053	37.5	77.5
Carleton	2378	35.0	77.0
Markton x Swedish Select	3013	37.0	77.0
Markton x Ligowa	3025	37.2	75.0
Markton x Scottish Chief	3022	34.8	74.2
Markton x Idamine	2570	36.7	72.0

C E R E A L C O U R I E R

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Vol. 30 Oct. 10, 1938 No. 16

Personnel (Sept. 26-Oct. 10) and Field Station (Sept. 16-30)

PERSONNEL ITEMS

Mr. John W. McLane, Assistant Biophysicist, retired for age on September 30. Entering the old Bureau of Soils in 1902, Mr. McLane was associated with Dr. L. J. Briggs during the development of the conception of moisture equivalent of soils and helped design the apparatus required in making the determinations.

With the transfer of Doctor Briggs to the Bureau of Plant Industry and the inauguration of the Physical Laboratory Mr. McLane accompanied him as a laboratory assistant. The new Laboratory shortly began its classic studies on the water requirement of plants and to these studies Mr. McLane contributed the ingenuity and meticulous care which has characterized all his work. He also joined with Doctors Kearney, Briggs, Shantz, and Mr. Piemeisel in a study of the relation of the vegetation to the characteristics of the soil in the Tooele Valley of Utah. Later, his skill and experience were widely utilized in the investigations on electroculture, impervious mulches, x-rays, and radiations of longer wave lengths. To all of his undertakings Mr. McLane brought patience, care, and industry,--qualities without which there can be no progress in experimental work.

Mr. McLane has earned the well wishes of many members of this Division and of those of the several Divisions with which he has been associated.

Dr. H. A. Rodenhiser and Mr. J. W. Taylor were at State College, Pa., on September 29 and 30 for the purpose of sowing a cooperative winter wheat smut nursery.

RECENT PUBLICATIONS

A. F. Swanson and H. H. Laude. Barley Production in Kansas. Kans. Agr. Expt. Sta. Bull. 280, 27 pp., 8 figs. September 1938. (Cooperative investigations of the Kansas Agricultural Experiment Station and the Division of Cereal Crops and Diseases.)

The annual meeting of the American Society of Agronomy will be held in Washington, D. C., November 16-18, 1938.

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Grain Sorghum and Broomcorn, J. B. Sieglinger) (Oct. 1)

Dry warm weather during the last part of September hastened ripening of sorghums. All varieties of the June 8th seeding have been harvested and over half of the varieties planted June 22 are also harvested. Indications are that yields will be above average this year though the forage yields will be relatively less than grain yields. All the broomcorn of the date-variety and varietal nursery has been harvested for brush yields, which will also rank with normal yields.

This is the first season in years that the sorghums have ripened normally before frost.

The maximum temperature for the last half of September was 97° on the 26th, and the minimum was 42° on the 20th. The precipitation was zero; for the entire month it was 2.12 inches.

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (Oct. 3)

The rate-and-date seeding of winter wheat and fall-sown barley made on September 15 emerged to uniform stands five days after planting. A similar seeding made on October 1 is expected to emerge October 5.

Seeding plans and packeting of seed for the 1938-39 nursery is completed. The nursery will be marked and staked off this week. Seeding will be started about October 10.

No rain has fallen since September 12, although 2.12 inches were reported during the month. The soil on farms and in the nursery is very dry as deep as it has been worked. On fallow land there is ample moisture to germinate seed, although the seedlings in some fields wilt during the heat of the day. Some damage from the wheat grub worms has been reported in the area northwest of Woodward.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) [Oct. 3]

The first killing frost this fall occurred on the 18th with a recorded temperature of 30°, about a week earlier than the average date. Tender garden vegetables and corn were killed but flax and volunteer small grains showed no noticeable injury. Since that date temperatures have been generally high for this time of year and no temperatures below freezing have been recorded. The maximum temperature for the last half of September was 94° on the 22d and the minimum 30° on the 18th. A tenth of an inch of rainfall was recorded on the 16th and no further precipitation has been recorded since that date.

The safflower plots were threshed Sept. 27 but the seed has not yet been cleaned and yields are not available.

Final data from the Uniform Regional Spring Wheat Nursery at Mandan are presented in the following table:

Agronomic and yield data on 25 spring wheat varieties grown in the Uniform Regional Spring Wheat Nursery at Mandan, N. Dak., 1938

Variety or cross	C. I. No.	Nursery No.	Rust		Test weight per bu.	Av. yield (Bu. per acre)
			Stem (Pct.)	Leaf (Pct.)	(Lbs.)	
H-44 x Ceres 1/	11883	1344-B	0	3	62.0	32.1
C.-D.C. x C.-H.F. 1/	11894	2746	6	T	61.3	30.3
H-44 x Thatcher	11890	II-29-52	T	T	60.2	30.1
H-44 x Reward	11869	R.L. 975.1	T	5 2/	61.0	30.1
Ceres x Hope-Florence	11712	2592	1	10 2/	62.0	29.2
C.-D.C. x C.-H.F. 1/	11895	2811	T	0	61.2	28.0
H-44 x Ceres	11882	1349	T	1	60.7	27.9
Reliance x N. N. 1110	11788	1248	T	20	59.8	27.5
C.-D.C. x C.-H.F. 1/	11893	2748	0	1	60.7	27.2
Thatcher	10003	----	7	50	61.3	27.0
H-44 x Marquis	11887	R.L. 704.1	1	T	61.5	27.0
H-44 x Ceres	11870	1348	T	1	60.0	27.0
H-44 x Marquis	11783	1552-9-B	2 2/	0	60.7	26.4
C.-D.C. x C.-H.F. 1/	11895	2743	T	0	60.0	26.1
Hope x Ceres	11885	1098-28	3	T	61.0	25.1
H-44 x Thatcher	11891	II-29-53	T 2/	T	60.0	24.6
H-44 x Double Cross	11892	II-28-27	1 2/	0	61.0	24.2
H-44 x Thatcher	11889	II-29-49	T 2/	T	61.2	24.0
H-44 x Reward	11868	R.L. 1097	5 2/	10 2/	62.7	22.9
Reliance x N. N. 1110	11884	1330	2 2/	5 2/	59.7	22.8
H-44 x Marquis (selection 1517)	11781	----	T 2/	T 2/	62.2	22.7
Hope x Ceres (S. Dak. 1463)	11897	----	1 2/	5 2/	60.8	22.3
H-44 x Thatcher	11791	II-28-61	T	T 2/	60.8	22.1
Reliance x N. N. 1110	11888	1329	2	10 2/	58.3	17.8
Ceres	6900	1658	70	60	56.0	16.3

1/ Ceres-Double Cross x Ceres-Hope-Florence.
2/ Segregating.

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (Oct. 1)

The month of September has been rather warm and very dry with only about 0.10 inch of precipitation. Winter wheat and rye varieties sown early in the month have had no chance to germinate yet. The first killing frost occurred on the morning of the 17th with a minimum of 25°. Corn at the Substation was harvested before frost but many fields over the State were still somewhat green when hit by the frost. Data from the various cereal experiments are being assembled and seed is being prepared for winter storage.

Actual average yield and other data from the highest yielding 25 strains in the Intra-State Nursery consisting of 100 strains are presented in the accompanying table.

Actual average yield and other data on highest yielding strains in the Intra-State Nursery at Dickinson, N. Dak., 1938

Variety or cross	Nursery No.	Key No.	Test weight	Bunt 1/	Rust		Estimated hopper loss	Actual av. yield (Bu. per A.)
					Leaf	Stem		
			(Lbs.)	(Pct.)	(Pct.)	(Pct.)	(Pct.)	
C.-D.C. x C.-H.F. 2/	2744	35	58.0	4	0.5	0.3	18	32.0
Comet x 1098	1465	71	60.0	2	9	2	15	28.5
C.-D.C. x C.-H.F. 2/	2805	48	59.0	0	T	T	15	28.3
Hope x Ceres	1098-13	58	58.0	8	0.3	T	16	28.2
C.-D.C. x C.-H.F. 2/	2794	37	58.0	0.6	0.5	0.8	23	27.7
Do	2778	15	60.0	28	3	0	16	27.5
Do	2783	10	58.0	6	5	0.3	16	27.5
Do	2777	14	60.0	9	5	0	15	26.3
H-44-Ceres x Marquis	1464	69	57.0	23	13	0.3	13	25.7
Comet x 1121	1386	74	57.0	2	10	0	15	25.7
C.-D.C. x C.-H.F. 2/	2775	12	59.0	26	0.3	T	16	25.5
Do	2797	30	57.0	3	1	1	20	25.5
Do	2785	22	58.0	7	0.3	2	12	25.3
Comet x 1098	1484	72	58.0	0	9	4	16	25.1
Ceres x H-44	1433	86	57.5	3	2	0.5	18	25.0
C.-D.C. x C.-H.F. 2/	2788	25	59.5	2	4	T	14	24.8
H-44-Ceres x Marquis	1394	68	58.0	11	13	0.5	17	24.7
Hope x Ceres	1347	59	56.0	2	1	0	16	24.6
C.-D.C. x C.-H.F. 2/	2786	23	58.5	9	0.8	0.3	18	24.3
Do	2802	45	57.5	2	1	5	13	24.2
Do	2816	36	58.0	2	2	T	21	24.1
Ceres x H-44	1409	85	57.5	8	1	2	15	24.0
C.-D.C. x C.-H.F. 2/	2789	26	60.0	5	2	8	17	23.7
Do	2812	51	58.0	0.6	T	0	20	23.6
Do	2749	29	60.0	11	T	0	15	23.5
Standard Varieties for Comparison								
Thatcher	----	32	59.5	23	1.4	5	21	18.6
Ceres	----	11	55.0	39	10	6.9	14	7.8

1/ Bunt percentages from separate nursery grown from bunt-inoculated seed.
2/ Ceres-Double Cross x Ceres-Hope-Florence.

MONTANA

AGRICULTURAL EXPERIMENT STATION, BOZEMAN (Wheat Improvement, R. H. Bamberg) (Oct. 5)

The weather has continued dry and warm for the last month and conditions have been ideal for harvesting and threshing small grains. Although the average date of the first killing frost is September 17, there has been no frost this year to date. The latest varieties of spring wheats have matured without freezing injury.

Winter wheat plots and nursery were seeded September 10 and 13, respectively, but the ground was so dry emergence in the nursery has not been uniform.

The hard red spring wheat nursery varieties are being threshed and within another week threshing of all plot and nursery wheats should be complete.

UTAH

AGRICULTURAL EXPERIMENT STATION, LOGAN (Cereal Agronomy, R. W. Woodward) (Oct. 4)

September has been relatively warm and dry as compared to the normal. Daily temperatures varied but a few degrees throughout the month, with a mean of 62.2°. A minimum of 36° was recorded on the 27th, which, by the way, is the date of average frost. Three light showers deposited 0.16 inch of moisture, which is rather insignificant for the dry condition of fallow land. Some little seeding has been done in the dry soil.

Corn silage varieties were harvested the latter part of September. Most varieties of the early seeding were well matured for silage and gave record yields for this area. Yields of a few of the 27 varieties tested are as follows:

Variety	Green silage	Early planting (Tons per acre)	Late planting (Tons per acre)	Av. yield (Tons)
Eureka Ensilage	Immature	34.05	36.23	35.14
Funks G. 53	Slightly immature	30.67	31.36	31.02
Iowealth 50	do	28.02	29.73	28.88
U. S. 44	Mature	27.26	29.69	28.48
U. S. 52	do	28.10	28.42	28.26
Illinois 960	do	27.37	26.06	26.72
Indiana Hybrid	do	26.28	27.19	26.74
Ohio W. 17	do	25.99	23.96	24.98
Imp. Leaming L 54	do	23.04	22.07	22.56
S. Minn. 13 (5071)	do	21.49	22.40	21.95
Colo. 13	do	15.03	19.57	17.30

C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

DEC 19 1938

Vol. 30 October 25, 1938 No. 17

Personnel (Oct. 11 - 25) and Field Station (Oct. 1 - 15)

PERSONNEL ITEMS

Mr. Bruce Caldwell returned to Washington on October 10 after making pollinations and taking notes on corn and teosinte plantings at the U. S. Regional Vegetable Breeding Laboratory at Charleston, S. C., at the U. S. Field Station, Sacaton, Ariz., and the Soil Conservation Station at Tucson, Ariz., and the U. S. Horticultural Field Station, La Jolla, Calif.

Mr. Charles E. Chambliss returned to Washington on October 10 from a two-month trip in Minnesota, Texas, Georgia, and Florida where he made a survey of the wild rice (Zizania aquatica) situation. In the lake region of northern Minnesota he worked in cooperation with the Office of Indian Affairs of the U. S. Department of the Interior with a view to increasing the area and production of wild rice for the use of the Chippewa Indians. In Texas Mr. Chambliss studied a new species of Zizania and in Georgia and Florida he located new areas of Zizania. In Georgia especially he collected data on the tolerance of wild rice, also locally known as water oats, to brackish water. Two bird refuges in Georgia were included in the investigations at the request of the U. S. Biological Survey.

Dr. M. T. Jenkins, Dr. K. S. Quisenberry, Dr. S. C. Salmon, and Dr. J. D. Sayre spent October 17 and 18 at Ames, Iowa, in conference with Dr. C. F. Sarle, in charge of crop-weather research, Division of Crop and Livestock Estimates, and officials of the Iowa Agricultural Experiment Station relative to statistical research and the utilization of statistical methods in crop forecasting and agronomic field experiments.

RECENT PUBLICATIONS

F. A. Coffman, H. C. Murphy, T. R. Stanton, L. C. Burnett, and H. B. Humphrey. New Smut and Rust Resistant Oats from Markton Crosses. Jour. Amer. Soc. Agron. 30(10): 797-815, fig. 1. October 1938. (Cooperative investigation between the Division of Cereal Crops and Diseases and the Botany and Plant Pathology Section and the Farm Crops Subsection of the Iowa Agricultural Experiment Station.)

C. C. Fifield, J. Allen Clark, Glenn S. Smith, J. F. Hayes, Alfred Christie, and Elwood Hoffecker. Milling and Macaroni Experiments with Durum Wheat (1932-1936). Macaroni Jour. 20(4): 12-14. August 15, 1938.

R. W. Leukel, T. R. Stanton, and Harland Stevens. Comparison of Different Methods of Inoculating Oat Seed with Smut. Jour. Amer. Soc. Agron. 30(10): 878-882. October 1938. (Cooperative investigations conducted by the Division of Cereal Crops and Diseases and the Idaho Agricultural Experiment Station.)

J. Foster Martin. Effect of Seed Disinfection and Delayed Sowing on the Control of Bunt in Infested Soil. Jour. Amer. Soc. Agron. 30(10): 870-877. October 1938. (Contribution from the Division of Cereal Crops and Diseases and the Oregon Agricultural Experiment Station.)

W. D. Smith, J. J. Deffes, C. H. Bennett, C. Roy Adair, and H. M. Beachell. Effect of Date of Harvest on Yield and Milling Quality of Rice. U. S. Dept. Agr. Circ. 484, 19 pp. July 1938.

T. R. Stanton. Progress in Oat Breeding for the South. Assoc. Southern Agr. Workers Proc. 39th. Ann. Conv. 1938, pp. 56-57. 1938.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
WASHINGTON

OFFICE OF CHIEF OF BUREAU
B. P. I. MEMO. 1017

October 20, 1938.

MEMORANDUM FOR HEADS OF DIVISIONS.

Gentlemen:

The American Association for the Advancement of Science will hold its meetings in Richmond, Virginia, December 27 to 31, 1938. Members of your staff who are to submit abstracts of papers to be presented at the meetings should be requested to submit these abstracts in the near future, as in many cases they must be in the hands of the secretaries of the various organizations the latter part of October or early November. It is desirable that they be forwarded to this office for approval promptly in order that they may reach the secretaries on the dates required.

It is suggested that you also bring to the attention of the members of your staff the importance of submitting the complete papers as soon as possible. If practicable, they should be sent to this office for approval not later than December 10. In exceptional cases, papers submitted after December 20 will be given approval.

Recommendations for attendance by members of your staff at Government expense should be submitted not later than November 15. Careful consideration should be given these recommendations, as attendance at Government expense will be limited. Full information regarding the purpose of attendance and the objectives to be accomplished should be included for each individual whose attendance is desired.

Will you kindly let me have your recommendations for attendance of employees of your division who desire to attend at their own expense, other than salary, not later than December 10? It has been the policy of the Department in the past to be liberal in approving recommendations where employees pay all of their own expenses, other than salary.

Very sincerely,

M. A. McCall
Acting Chief of Bureau.

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

NEW YORK

CORNELL UNIVERSITY AGRICULTURAL EXPERIMENT STATION, ITHACA (Cereal Breeding, H. H. Love) (Oct. 15)

It may be of interest that Yorkwin wheat yielded unusually well this year. Wheat yields in New York State were very satisfactory anyhow, but Yorkwin gave an unusually good account of itself. On one farm, for example, the yield was over 60 bushels and we heard of yields higher than this but we have not verified these reports. Fifty bushels and over were obtained by a number of growers. A number of the members of the New York Seed Improvement Association grew seed which was certified and the last reports indicate that there must have been 20,000 bushels; or more, of certified seed sold to new growers. In addition to this there was some seed that did not pass certification that we know was distributed. It seems that Yorkwin will largely replace Honor and Junior No. 6. Its 8-year average yield is 39.7 bushels, while Honor yielded 33.0 and Junior No. 6, 31.9 bushels. Valprize during the same period gives 35.2 and Forward 35.0.

We planned to sow wheat about the middle of September, as we commonly do, and did begin on September 12. We sowed our seed rows, advanced test, both random and systematic, and one series of the single 10-rod row test. We had an unusually heavy rain that night and a considerable amount for the next two weeks. Therefore we were not able to get back on the land to continue the sowing until the 30th of September. We finished sowing all of the material, including the drill plots and the increase plots, on October 1. The material is now up and growing nicely. We have had a rather warm week, and while we are now beginning to need a shower I think there is still enough moisture to keep the things growing without suffering too much, especially if we can have a rain within another week. This is the latest that we have sown for some years, although we have sown as late as October 10 and still harvested a satisfactory crop. In fact, one of the best crops we have ever obtained was from the October 10 sowing.

The farmers in the State were caught much in the same way. A number had sown early in September and their crops are looking well. Others were unable to sow until the spell of rainy weather was over and their fields are just beginning to show green.

LOUISIANA

RICE EXPERIMENT STATION, CROWLEY (Rice Agronomy, J. M. Jenkins) (Oct. 11)

The maximum temperature in September was 94° and the minimum 52°; the average mean was 75°.

Exceptionally wet weather prevailed during the first 18 days but no rain fell in the last 12 days of the month. The total precipitation of 7.80 inches fell on 10 days. This is 5.68 inches more than in September 1937, and 3.90 inches more than the 28-year average for September. In only two of the past 28 years has the September precipitation exceeded that of this year. In 1913 and 1930 it was 13.67 and 10.84 inches, respectively.

The wet weather in early September did not interfere materially with the rice harvest, because most of the early maturing portion of the crop had been threshed and the harvesting of the later maturing rices had just commenced.

Work on the Station progressed satisfactorily, except for delay in cotton picking caused by heavy rains. The cotton was damaged but there was practically no loss in weight.

Mr. B. C. Bernardes of Brazil was a visitor for the third time on September 26. He has been in the United States for several months acquainting himself with experimental and commercial methods with rice. Upon his return to Brazil he is to have charge of a thousand-acre rice experiment station. It is his intention to devote a part of the tract to experimental work and use the remainder for the purpose of demonstration and the increase of seed rice for distribution to farmers.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (Oct. 15)

Nursery seeding started on October 10 and should be completed by the 22d if present weather conditions continue. Wheat seeded on October 10 has emerged though later seedings may germinate irregularly because of a dry surface soil. The grain is being sown as deep as possible and in most instances is resting on a moist subsoil though it may be covered with dry soil. Nineteen winter wheat varieties seeded in quadruplicated 1/47th-acre plots on October 14 and a rate-and-date seeding of winter barley should emerge promptly.

No rain of consequence has fallen at Woodward since September 12, though general rains are reported in the Panhandles of Oklahoma and Texas. As much as three inches is reported in some areas and as a consequence winter wheat is in very good condition. Roughly 75 percent of the wheat to be sown in northwestern Oklahoma has been seeded and is emerged. Armyworms have caused serious damage in numerous fields in areas north, west, and southwest of Woodward, necessitating reseeding of some early sown fields. Damage from wheat grubworms has been noted but is not so extensive as in the crop year of 1937-38.

KANSAS

AGRICULTURAL EXPERIMENT STATION, MANHATTAN (Wheat Leaf Rust, C. O. Johnston) (Oct. 22)

The fall of 1938 has been the warmest and driest on record at Manhattan and in most other parts of the State. Only 0.79 inch of rain fell in September at Manhattan and thus far only 0.3 inch has fallen in October. The topsoil is extremely dry and much winter wheat was sown in bone-dry seedbeds throughout the State. As a consequence there has been little or no emergence in many localities or emergence has been very uneven. Many fields present a patchy appearance with fair stands in low spots and bare ground on dry knolls and hillsides. Some farmers complain that the wheat emerged but the seedlings soon died from drought.

Accompanying the drought there have been most unusual temperatures for this season of the year. Killing frosts occurred on September 19 and 20--nearly a month earlier than usual. Although not heavy enough to kill all green vegetation these frosts killed sorghums and late corn, preventing the full development of late feed and silage crops. After that brief cold period temperatures rose into the upper 80's and 90's, and remained abnormally high until October 18.

The rust nursery was sown during the period of October 4 to 14. The seedbed was dry as dust, very cloddy, and emergence was not obtained until water was applied. For the first time in the progress of the rust work at Manhattan the rust nursery had to be irrigated in the fall. By means of overhead irrigation about one-half inch of water was applied on October 16, 17, and 18. Fair emergence is now being obtained but it still is not normal.

The 1938-39 rust nursery at Manhattan consists largely of space-sown hybrid lines involving resistance to both leaf and stem rusts. Out of a total of slightly more than 2,800 rows about 2,000 rows are space-sown. The spaced material is mostly in the F_2 and F_3 generations and represents crosses involving rust resistance derived from the spring wheats Thatcher, Renown, Apex, and Ceres-Hope-Florence as well as from known resistant winter wheat hybrid lines such as Mediterranean x Hope, Hope x Hussar, Hope x Kawvale, Marquillo x Tenmarq, and Marquillo x Oro. Many of the crosses, therefore, are compound crosses involving three or more wheat varieties.

Greenhouse plantings for rust work during the winter are under way but have been delayed by the press of field work and congestion in the greenhouse. Two new greenhouses and a connecting headhouse were constructed during the summer, but these cannot yet be occupied because of the absence of heat, light, and water. Plans for these are complete and it is hoped the new space can be occupied by the first of the year. When the new construction is completed, Kansas will have an excellent research plant consisting of four 30 x 100 ft. greenhouses joined on the north to a two-story headhouse 20 x 100 ft. The main floor of the headhouse contains five small laboratories to be used in conjunction with greenhouse space. Cereal rust investigations have been assigned new space equivalent to one-fourth of one greenhouse and half of one laboratory.

NORTH DAKOTA

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (Oct. 15)

The weather in October has remained rather dry and warm with a few light showers totaling 0.32 inch. This has been insufficient to bring about emergence of winter wheat and rye seeded early in September. In the nursery, where the ground was rather hard and the seeding shallow, some kernels have germinated, but unless more rain falls soon the roots probably will dry out and die before winter. In field plots where seeding was at the normal depth moisture has not penetrated to the seed enough to start germination.

Field work with cereal crops was completed with the husking and weighing of corn varieties. The latter gave low yields due to grasshopper injury.

Yields and other data on the cereal experiments are being computed and assembled.

Comparatively few killing frosts have occurred since the first one on Sept. 18, which had the lowest temperatre, 25°.

C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 November 10, 1938 No. 18

Personnel (Oct. 26 - Nov. 10) and Field Station (Oct. 16-31)

PERSONNEL ITEMS

Dr. B. B. Bayles spent the first week of November at Wooster, Ohio, and La Fayette, Ind., making plans for future cooperative work with wheat.

Mr. Lewis S. Evans will come to Washington about November 14 to assist in the preparation of reports on cooperative weed control investigations. He will be in Washington about a month.

Dr. Earnest R. Sears and Dr. Luther Smith came to Washington November 8 to confer with personnel of the Division concerning cooperative genetics research and to prepare reports and manuscripts. They will be in Washington until about December 1.

RECENT PUBLICATIONS

Jenkin W. Jones, J. Mitchell Jenkins, R. H. Wyche, and Martin Nelson. Rice Culture in the Southern States. U. S. Dept. Agr. Farmers' Bull. 1808. 29 pp., 20 figs. October 1938.

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

LOUISIANA

RICE EXPERIMENT STATION, CROWLEY (Rice Agronomy, J. M. Jenkins) (Nov. 7)

October was next to the driest month on record at this Station. The total precipitation was only 0.67 inch. In October 1924 no precipitation occurred, and in October 1917, 1934, and 1935 the precipitation was 0.69, 0.77, and 0.77 inch, respectively. The 28-year average precipitation for October is 3.53 inches.

Temperatures were somewhat higher than in October 1937. The average mean was 71°. In October of last year the average mean was 69°.

Because of the excellent weather nearly all farmers were able to complete rice threshing by the end of the month.

On the Station, at the end of the month, only a few rice plots in the date-of-seeding experiment and a few nursery rows remained to be harvested. If the weather permits, threshing will begin in the first week of November.

MINNESOTA

AGRICULTURAL EXPERIMENT STATION, UNIVERSITY FARM, ST. PAUL (Wheat Breeding, E. R. Ausemus) (Nov. 3)

The weather during October was unusually warm and dry. Winter wheat was sown about a week to 10 days later than normal. In most of the area it did not rain until October 22, and therefore the germination of winter wheat was poor. It was estimated that in many fields 25 to 40 percent of the seed had not germinated prior to the October 22d rain. The wheat that did emerge has made a luxuriant growth. Killing frost did not occur until October 22.

The maximum temperature recorded at Minneapolis was 86° on the 9th, the minimum 26° on the 24th, and the mean 55.4° as compared with a normal mean of 48.9°. The precipitation for the month was 0.54 inch, as compared with the normal rainfall of 2.08 inches.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Grain Sorghum and Broomcorn, J. B. Sieglinger) (Nov. 1)

October was favorable for ripening and harvesting sorghums and for selecting seed of both sorghums and broomcorn. The first killing frost (24°) occurred on the 23d of October, which is more than a week earlier than the average date. With the exception of several chronically late-maturing sorghums in the varietal nursery, crops of the project were ripe before or at the time of the freeze.

The Pythium root rot disease of milos and darso was definitely apparent in the project this season for the first time. A trip was made to Garden City, Kans., to obtain first-hand information on Pythium resistant selections of milos.

Rain is needed in this region for winter wheat and to prevent dust and soil blowing.

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (Oct. 31)

August, September, and October have been dry. Three showers in October totaled 0.20 inch. The August rainfall was 1.09 inches short of the 22-year Station average. September and October were 0.54 inch and 2.13 inches short, respectively. The maximum temperature in October was 98° on the 1st; the minimum was 24° on the 22d, and the mean 66°.

Winter wheat and barley seeded deep with a disk drill emerged to good stands. Nursery seedings made with a Columbia planter, however, were not seeded so deep and emergence is very irregular. It is probable that a rain in the near future would even up the stands, as most of the seed not yet up did not have moisture enough to start growth. Some farmers who have held off seeding in hopes of rain are now dusting in their wheat. A few are still waiting for a rain before seeding.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (Nov. 1)

Unusually mild, dry weather prevailed during October. The maximum temperature was 86° on the 3d and the minimum 15° on the 22d. The total precipitation was only 0.21 inch. Rain began this morning and apparently more has already fallen than during all of the past seven weeks.

Most of the flax that was still green on October 22 was killed or badly damaged by the low temperature. Occasional plants, however, showed no noticeable damage to the leaves or stems, but immature seed in green bolls turned black, indicating that development was arrested. Rust in the red stage was noted on growing volunteer flax today.

Stem rust in the red stage was noted on green wheat plants in the field today but no leaf rust was found.

Threshing of the flax nursery row material was completed some time ago, but considerable selection material still remains to be threshed.

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (Nov. 1)

The month of October was unusually warm with a mean temperature of 48.7°, or about 5° above normal. The total precipitation was 0.74 inch, which is slightly below normal. A drizzling rain set in this morning and has totaled 0.63 inch with a possibility of more before clearing up. There was but one snowsquall during October and the snow melted soon after falling. The minimum temperature was 16° one morning but the minimum was above freezing on most mornings.

The winter wheat nursery emerged October 26 with fair stands after being moistened by light showers in late October. The stand is being injured by jack rabbits. Field plots of winter wheat and rye have very thin stands. If warm weather follows the rain, more plants may emerge before freeze-up.

AGRICULTURAL EXPERIMENT STATION, STATE COLLEGE STATION, FARGO (Wheat Improvement, G. S. Smith) (Nov. 5)

Except for one showery period the first week in September, the fall at Fargo has been very dry. The precipitation for September was 1.97 inches and for October only 0.15 inch. At Langdon only 0.01 inch was recorded for September and only a few light showers have fallen in October.

Both September and October have been unusually warm. At Fargo, September temperatures averaged 2.9° above normal, and October temperatures averaged 7.6° above normal. At Langdon, the September average was 9.1° higher than usual (with a maximum of 96°). Data for October have not yet been reported but the weather was warm.

The prospects for 1939, therefore, depend almost entirely on spring moisture conditions.

The warm, bright fall has hurried the greenhouse crop which, sown outside on September 1, and transplanted inside October 5, is now beginning to head. Artificial illumination is also being used.

MONTANA

AGRICULTURAL EXPERIMENT STATION, BOZEMAN (Wheat Improvement, R. H. Bamberg) (Nov. 5)

The first killing frost this fall occurred on October 14, 27 days later than the average date. Rain and snow since October 8 have brought more than two inches of much needed moisture in addition to approximately six inches of snow last night.

Threshing of all grain has been completed and yields and test weights have been taken on some groups of material. The yields of the 25 spring wheat varieties comprising the Uniform Regional Nursery, and of Marquis, are given in the accompanying table for the 3 Montana Stations, Bozeman, Moccasin, and Havre.

Yield of 25 spring wheats grown in the Uniform Region Spring Wheat Nursery, and Marquis, at Bozeman, Moccasin, and Havre, Mont., 1938

Variety or cross	C. I. No.	Bozeman Yield (Bu. per A.)	Moccasin Yield (Bu. per A.)	Havre Yield (Bu. per A.)	Av.
Hope x Ceres	11885	57.9	24.0	31.7	37.9
Thatcher	10003	52.8	21.2	38.4	37.5
H-44x Marquis	11887	56.4	21.9	34.0	37.4
C.-D.C. x C.-H.F. 1/	11893	55.7	23.1	30.2	36.3
Ceres	6900	49.6	22.2	35.1	35.6
H-44 x Double Cross	11892	48.2	23.6	35.0	35.6
H-44 x Ceres	11883	52.9	22.3	31.4	35.5
Ceres x Hope-Florence	11712	49.4	21.2	35.4	35.3
H-44 x Ceres	11882	53.6	20.9	30.4	35.0
H-44 x Thatcher	11890	50.6	21.0	31.8	34.5
H-44x Marquis	11783	51.7	21.1	30.1	34.3
Reliance x N.N. 1110	11884	52.9	21.7	28.1	34.2
H-44 x Reward	11869	46.0	22.1	32.8	33.6
H-44 x Thatcher	11891	48.3	20.8	31.1	33.4
Do	11791	48.3	20.4	31.3	33.3
C.-D.C. x C.-H.F. 1/	11894	46.1	19.5	32.7	32.8
H-44 x Ceres	11870	45.0	22.1	30.4	32.5
H-44 x Marquis	11781	50.7	20.6	26.3	32.5
C.-D.C. x C.-H.F. 1/	11895	43.4	23.1	30.2	32.2
H-44 x Thatcher	11889	41.5	19.9	32.7	31.4
Reliance x Hope	11788	55.6	17.6	20.3	31.2
Hope x Ceres	11897	44.0	19.7	27.6	30.4
Reliance x N.N. 1110	11888	48.1	18.6	23.1	29.9
C.-D.C. x C.-H.F. 1/	11899	41.8	18.5	28.1	29.5
H-44 x Reward	11868	32.9	20.7	28.6	27.4
Marquis	3641	34.3	20.4	29.0	27.9

1/ Ceres-Double Cross x Ceres-Hope-Florence.

UTAH

AGRICULTURAL EXPERIMENT STATION, LOGAN (Cereal Agronomy, R. W. Woodward) (Nov. 2)

Clear, warm weather has prevailed throughout most of October. Two major storms, one on the 16th and one on the 31st, have brought nearly 2.5 inches of moisture. These storms were especially valuable in the light of the long dry spell preceding the rains. Winter wheat could not emerge until the storm of the 16th, which has brought most of it up to fair stands. More growth is desired before winter sets in.

At this time tomatoes and flowers are still in bloom on the campus although a frost on the 19th killed tender plants in the Valley. Average fall frosts occur on September 27, which makes this a rather long season.

The snow line is well down the mountain slopes. Several valleys in the State report blizzards on November 1. Most crops except sugar beets are harvested. A large portion of the beet crop remains to be harvested. Yields of 28 to 33 tons per acre are often reported, which is above average.

The precipitation for October was 2.46 inches and the mean was 1.53 inches; the mean maximum temperature was 62° and the mean minimum 36°; the evaporation was 2.20 inches.

CALIFORNIA

BIGGS RICE FIELD STATION, BIGGS (Rice Agronomy, L. L. Davis) (Nov. 1)

The rice harvest has been temporarily delayed in California because of rain. It is estimated that only slightly over half of the crop is harvested. With clearing weather it is expected that harvesting and threshing can be completed in about two weeks with only slight damage to the crop. Plot variety and nursery threshing remains to be completed on the Station.

The season's rainfall to date this year (September and October) totals 2.97 inches, whereas the 25-year average for the same period is only 1.15 inches.

Rice yields in California this year are satisfactory and the Station yields are relatively good but not so high as last year's. Prices of California rice are low, the best quality lots selling around $1.20 per cwt.

UNIVERSITY FARM, DAVIS (Cereal Agronomy, C. A. Suneson) (Nov. 1)

Fire early this morning completely destroyed the seed warehouse at the Farm. Of the contents, our greatest interest was in the new backcross derived, Baart 38 and White Federation 38 (with Martin resistance to bunt and Hope resistance to rust), and the new Pythium root rot resistant Double Dwarf milo. The latter had been increased on 40 acres and some 60 tons of seed had been harvested only recently. Of this about 15 tons is being salvaged, but because of the heat and moisture associated with the fire may give low germination. Similarly, about 1 ton of White Federation 38 and 2 tons of Baart 38 are being salvaged from a total stock of about 12 tons which we had contemplated increasing on 400 acres in 1939. Obviously our plans for widespread dissemination of these seed stocks next year will have to be revised materially. Nevertheless, we are very fortunate in being able to recover as much seed in the ruins as we are. All our extensive seed cleaning and treating equipment was lost. Small reserves of all varieties were stored in another building so we could be worse off on that score too.

Tobacco experiments curing in the loft of the warehouse were completely lost.

DEC 29 1938
PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S. Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 November 25, 1938 No. 19

Personnel (Nov. 11 - 25) and Field Station (Nov. 1 - 15)

PERSONNEL ITEMS

Mr. A. C. Dillman attended the meetings of the Flax Institute of the United States at Minneapolis, Minn., November 4.

Dr. J. G. O'Mara came to Washington November 14 for a conference with members of the Division staff concerning cooperative cereal research.

Dr. K. S. Quisenberry arrived in Washington on November 16 to confer with members of the Division staff regarding cooperative investigations with small grains. On his return to Lincoln, Nebr., on December 6 he will make stops at Morgantown, West Va., and Wooster, Ohio.

Dr. L. F. Randolph came to Washington on November 14 to confer with members of the Division staff concerning corn research.

Mr. Coit A. Suneson came to Washington on November 14 for a 2-week stay to confer with members of the Division staff with reference to cereal research in the far western States.

RECENT PUBLICATIONS

D. D. Hill, D. E. Stephens, D. E. Richards, Roy E. Hutchison, and J. F. Martin. Barley Production in Oregon. Oreg. Agr. Expt. Sta. Bull. 355, 34 pp., illus. June 1938. (Cooperation between the Oregon Agricultural Experiment Station and the Division of Cereal Crops and Diseases.)

E. S. McFadden. Flax, a Winter Crop for South Texas. Limited Experiments Indicate the Possibilities as a Cash Crop. Prog. Farmer Tex. ed. 53(10): 8, 44. October 1938. (Cooperation between the Division of Cereal Crops and Diseases and the Texas Agricultural Experiment Station.)

Richard S. Rosenfels. The Sensitization of Paper Strips with Filtered Mercuric Bromide Solution in the Gutzeit Method of Arsenic Analysis. Jour. Assoc. Off. Agr. Chem. 21: 493-496. August 1938. (Cooperative investigations of the California Agricultural Experiment Station and the Division of Cereal Crops and Diseases.)

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

ARKANSAS

RICE BRANCH STATION, STUTTGART (Rice Production and Improvement, C. R. Adair) (Nov. 14)

Weather conditions during August, September, and October were almost ideal for harvesting and threshing rice. All varieties at the Station, with the exception of Rexoro and Iola, sown before June 1, matured before the first killing frost on October 24.

The grain yield of all rice varieties was low this year. This was partly due to unfavorable conditions at seeding time which resulted in poor stands. As noted in table 1 the average daily temperature for September this year was higher than the 9-year average. However, there was a period of subnormal temperatures from September 15 to September 23. These low temperatures occurred at the time of flowering of the later varieties and probably were responsible for more sterility than usual.

The average yields of grain for 1938 are given in table 2. The yields were much lower this year than the average for the past 7-year period. The yields were lower this year than they were in any year during this period, except 1935.

Although some high yields were reported on commercial fields, low yields were common throughout the rice territory. Yields on commercial fields as low as 16 bushels per acre have been reported. Yields of 20 to 30 bushels per acre on commercial fields were not unusual this year, whereas yields normally range around 50 bushels per acre. In addition to the low acre yields, the mills are reporting that the quality is low.

The season has been very unfavorable for fall-sown oats and winter legumes. As a result of the low rainfall and high temperatures during the late summer and fall, the soil did not contain enough moisture for germination of crops sown in late September. Seeding of winter oats was delayed until the middle of October when they were sown in the dust. None of the seed germinated until the 2.30-inch rain on November 4. The oats are starting to emerge at this time.

Table 1.--Rainfall and average daily temperatures for August, September, and October, 1938, and averages for 1930-38.

Month	Rainfall (In.)		Average daily temperature (°F.)	
	1938	1930-38	1938	1930-38
August	2.22	1.93	83.1	82.0
September	1.83	2.52	76.3	71.9
October	.21	2.76	66.2	63.5

Table 2.---Yield of rice varieties grown in field plots, Stuttgart, Ark., 1938.

Variety	C.I. No.	Grain Yield 1938 1/	
		(Bu.)	(Lbs.)
Zenith	7787	34.7	1,561
Fortuna	1344	40.0	1,801
Acadia	1988	38.4	1,730
Caloro	1561-1	32.6	1,469
Supreme Blue Rose	5793	31.8	1,430
Shoemed	3625	38.5	1,732
Early Prolific	5883	33.9	1,525
Nira	2706	35.6	1,603
Early Blue Rose	7785	35.5	1,595
Delitus	1206	31.0	1,397
Iola	4559	11.8	531
Rexoro	1779	---- 2/	----

1/ Average of 5 plots.

2/ No grain produced before first killing frost.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Grain Sorghum and Broomcorn, J. B. Sieglinger) (Nov. 16)

The first half of November continued dry and the wind has blown persistently. Rain is needed for winter grains and to prevent soil movement.

The sorghum plots of the project were threshed on the 14th and 15th. The sorghum heads were very dry and a good job of threshing was done. Yields will be computed from recleaned grain and will be higher than in recent years.

The maximum temperature for the first half of November was 81° on the 2d and the minimum for the same period was 24° on the 7th. The precipitation was 0.37 inch on the 3d.

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (Nov. 16)

The drought of nearly six weeks duration was partially broken on November 2 by a 0.37 inch rainfall. The rain was very general and much heavier in the central and north-central parts of Oklahoma, amounting to as much as two inches in some localities. A narrow strip extending north from Woodward and well into Kansas apparently received less rain than any other part of the Oklahoma wheat belt.

The precipitation was ample to germinate seed that had lain dormant in the nursery since October 12 but was not sufficient to soak down to subsoil moisture in listed or deep plowed land, and therefore fields prepared in those ways are still too dry to germinate seed.

November 1 seedings of wheat, barley, and oats emerged to good stands on November 13. September 15 seedings show some wireworm and armyworm damage as do many early sown farm fields. It is probable that the recent cool weather has put a halt to further worm damage this fall, although reports have come in that at least 30,000 acres in northwestern Oklahoma will need reseeding because of one or more factors, namely, drought, wireworms, armyworms, wheat grubs, or webworms.

KANSAS

AGRICULTURAL EXPERIMENT STATION, MANHATTAN (Wheat Leaf Rust, C. O. Johnston) (Nov. 10)

The protracted fall drought in Kansas was broken by heavy rains on November 2 and 3. At Manhattan, 2.54 inches of moisture fell over a 24-hour period and very little of it ran off. The soil is now well saturated and winter wheat that had not germinated before the rain now is beginning to emerge. Rainfall was heavy over the entire State except in a few southeastern counties that were not in such dire need of moisture. Temperatures have been mostly mild and favorable for the fall growth of wheat except for a short cold period on November 6 and 7. A light snow fell on November 6 but melted on the following day.

Despite the drought there has been considerable leaf and stem rust on volunteer wheat this fall. Early in September stem rust was abundant in the vicinity of Manhattan. The long period greatly reduced the amount of rust but some uredia still could be found on November 1. The stem rust of oats also was fairly abundant on volunteer oat plants. Leaf rust of wheat was difficult to find during the warm weather of October but now is fairly common on volunteer plants. In the writer's opinion the infections of both leaf and stem rust of wheat are due to oversummering urediospores rather than to spores blown in from the North. Infections obviously developed during August before there were sufficiently general north winds to carry spores into this area. Reports from Oklahoma state that both leaf and stem rust are abundant in that State. Most infections are primary in nature and the widespread distribution of such infections indicates a rather general oversummering of urediospores.

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C E R E A L C O U R I E R

Official Messenger of the Division of Cereal Crops and Diseases
Bureau of Plant Industry, U. S.Department of Agriculture
(NOT FOR PUBLICATION)

Vol. 30 December 10, 1938 No. 20

Personnel (Nov. 26 - Dec. 10) and Field Station (Nov. 16 - 30)

PERSONNEL ITEMS

Mr. L. W. Kephart attended the meetings of the Seed Council of America in Chicago, Ill., on December 1.

RECENT PUBLICATIONS

James G. Dickson. A Survey of Malting Quality of Barley Varieties Grown in the United States. Modern Brewer 20(4): 36-44, 87. October 1938. (Cooperative investigations between the Division of Cereal Crops and Diseases and the Wisconsin Agricultural Experiment Station.)

Jenkin W. Jones. The "Alkali Test" as a Quality Indicator of Milled Rice. Jour. Amer. Soc. Agron. 30(11): 960-967, figs. 1-4. November 1938.

J. H. Kempton. Guy N. Collins. Science 88(2290): 467-468. November 18, 1938.

Lawrence F. Martin and H. H. McKinney. Tobacco-Mosaic Virus Concentrated in the Cytoplasm. Science 88(2289): 458-459. November 11, 1938. (Cooperation between the Food Research Division of the Bureau of Chemistry and Soils and the Division of Cereal Crops and Diseases, Bureau of Plant Industry.)

Richard S. Rosenfels. Determination of Chlorate in Soil Extracts, Culture Solutions, and Plant Sap. Jour. Assoc. Off. Agr. Chem. 21(4): 665-674. November 1938. (Cooperative project on control of noxious weeds carried on by the California Agricultural Experiment Station and the Division of Cereal Crops and Diseases.)

S. C. Salmon. Unbalanced Arrangements of Plats in Latin Squares. Jour. Amer. Soc. Agron. 30(11): 947-950, fig. 1. November 1938.

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF BUDGET AND FINANCE
WASHINGTON, D. C.

NOV. 29, 1938

Budget and Finance Circular No. 104

Purchase of Plain Envelopes to be Discontinued

A recent informal survey indicates that considerable quantities of plain envelopes, i.e., those which do not bear the name of the Department and using bureau, still are being ordered by some bureaus and offices. With the exception of definite special uses, such as for example for seeds, photo filing, etc., apparently there should not be much, if any, need officially for plain envelopes. In the interest of economy therefore the purchase of plain envelopes should be discontinued except where required for such definitely special offical uses.

W. A. Jump
Director of Finance.

N O T I C E

Attention is directed to the following memorandum.

November 28, 1938

MEMORANDUM FOR HEAD CLERKS,
Bureau of Plant Industry.

Will you kindly request all employees under your jurisdiction to forward to the Office of Accounts the cover of "Tax Exemption Certificates" as soon as the book is exhausted?

Any books on hand containing certificates that will not be used should be turned in for cancellation.

Very truly yours,

W. P. Cox
Assistant in Charge of Accounts.

AMERICAN SOCIETY OF AGRONOMY

The annual meetings of the American Society of Agronomy were held in Washington, D. C., November 16 to 18, 1938. In the Crops Section meetings, Dr. M. A. McCall presided over a program devoted to Physiology of Crop Plants, Dr. K. S. Quisenberry over one devoted to Cytogenetics and Breeding of Cereal Crops, and Dr. M. T. Jenkins over a round table discussion of Induced Polypoidy by Colchicine and Other Agents.

Division personnel, who attended and participated in the program, included M. N. Pope, Luther Smith, E. R. Sears, L. F. Randolph, W. J. Sando, L. S. Evans, R. D. Lewis, and J. H. Martin. In addition, papers prepared by L. M. Stahler and F. L. Timmons were read at the meetings.

Fellows-elect were W. H. Pierre, C. J. Willard, and I. P. Trotter. Officers for 1939 are, as follows:

President: Dr. R. J. Garber, U. S. Regional Pasture Research Laboratory, State College, Pa.

Vice-President: Dr. F. J. Alway, Chief, Division of Soils, Agricultural Experiment Station, St. Paul, Minn.

Chairman, Crops Section: Dr. F. D. Keim, College of Agriculture, University of Nebraska, Lincoln, Nebr.

Chairman, Soils Section: Dr. W. A. Albrecht, College of Agriculture, University of Missouri, Columbia, Mo.

Editor: Mr. J. D. Luckett, New York State Agricultural Experiment Station, Geneva, N. Y.

Secretary-Treasurer: Dr. G. G. Pohlman, University of West Virginia, Morgantown, West Va.

J.H.M.

FIELD STATION CONDITION AND PROGRESS

(All experiments except those conducted at the Arlington Experiment Farm, Arlington, Va., are in cooperation with State agricultural experiment stations or other agencies.)

LOUISIANA

RICE EXPERIMENT STATION, CROWLEY (Rice Agronomy, J. M. Jenkins) (Dec. 6)

Weather conditions in November were ideal for the completion of harvest operations. While the precipitation of 4.49 inches was a little above the 28-year average, 3.46 of it occurred on the 4th. Temperatures were somewhat more extreme than those in November 1937 and the average mean was 2° higher.

The maximum temperature for the month was 84°, the minimum 23°, and the average mean 58°. In November 1937, the maximum was 82°, the minimum 27°, and the average mean 56°.

The first ice of the season occurred November 9 with a temperature of 30°. Ice formed on 7 other days in the month. In 1937, the first ice occurred November 18, and formed on 6 days in the month.

All threshing operations were completed on the Station before the end of the month. Yields as a whole were satisfactory, and in some instances they were higher than they were last year. The yields from plots that were grown on land seeded continuously to rice over long periods of years were higher than they have been in the past several years.

Low temperatures on October 24 and 25 reduced the yields of certain varieties sown late in the date-of-seeding experiment, and the ice in early November prevented the maturity of several late maturing ones.

Recent Station visitors included Messrs. Felix Malberti, Fernandez Grau, Barreto, Mendoza, and Varona of Cuba; Zeeger Deenik of Umbogintwini, Natal Africa, and Charles D. Ridgway, President of Corn Products Ref. Co.'s subsidiaries in the Dominican Republic.

TEXAS

AGRICULTURAL EXPERIMENT STATION, COLLEGE STATION (Wheat Improvement, E. S. McFadden) (Dec. 3)

The fall has been very dry, which made early fall soil preparation impossible. As a result, the nursery seeding of all cereal crops and flax were made about three weeks later than usual. Dry weather still continues, but there has been enough moisture to give good stands of everything and make fair growth possible.

Rather extensive nursery seedings of flax were made here at the Station this year. Most of the seedings were duplicated at the Beeville Substation under dryland conditions and at the Winter Haven Substation under irrigation. A uniform flax nursery of 11 varieties was also grown on the Substation at Angleton on the Gulf Coast Prairie and at Weslaco in the lower Rio Grande Valley. Good to excellent stands have been reported for all of these nurseries.

The greater part of the flax seedings were made at College Station on November 11 and emerged during a cool spell with night temperatures running progressively lower from 40° down to 24° about 5 days after emergence. This is the lowest temperature I have ever seen flax seedlings survive. But, in this case, very few plants showed any injurious effect from the cold. It seems probable that this was due to a hardening-off process that the plants went through during the five days preceding the lowest temperature. The cool, cloudy weather that prevailed for several days following the freeze may also have enabled the plants to recover somewhat before they were again exposed to bright sunlight.

A large commercial acreage of flax was seeded between San Antonio and Corpus Christi this fall with registered Bison seed shipped in from Minnesota and North Dakota in carload lots. Several thousand acres have also been seeded to flax in the lower Rio Grande Valley. This is part Bison and part Punjab. At least one carload of Punjab was shipped into that area from southern California; one man seeded a thousand acres to that variety.

In the area along the Gulf Coast from Beaumont to Victoria, the wet weather encountered during harvest this year has tended to dampen the enthusiasm of some of the farmers for flax. However, there will be several fields of 10 to 100 acres or more seeded in most of the counties in that area. Some of this will be on abandoned rice land. In one old rice district west of Houston, where the soil is quite sandy, several seedings of flax have been made following peanuts. After the peanuts are dug, the only preparation of the land needed to put it in perfect condition for flax is a good cross harrowing. This is poor soil, but it is believed that the fertilizer applied to the peanuts will have sufficient residual effect to give the flax a good start. If the flax survives the winter and appears to need more plant food in the spring, it will be given a top dressing of a quick acting fertilizer at that time. The flax should mature in time to make it possible to plant back to peanuts next summer. If good rains are received after the flax is removed, it is probable that this system of double cropping of the land will be given a trial.

OKLAHOMA

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Grain Sorghum and Broomcorn, J. B. Sieglinger) (Dec. 2)

Grain from the sorghum plots has been recleaned and weighed. Results for the date-varietal experiments were, as follows:

Variety	C. I. No.	Yield in bushels[1] (56 lb.) per acre		
		June 8 seeding	June 22 seeding	Average of 2 dates
Dwarf milo	332	30.0	35.4	32.7
Finney milo	1089	25.6	36.0	30.8
Beaver milo	871	17.5	28.8	23.2
Wheatland milo	918	27.1	29.3	28.2
Feterita	182	26.3	28.0	27.1
Spur feterita	623	25.3	32.1	28.7
Dwarf hegari	750	16.6	12.4	14.5
Chiltex	874	25.7	31.8	28.7
Ajax	968	27.2	32.2	29.7
Club kafir	901	28.2	38.7	33.5
Sedan Red kafir	1103	26.5	34.1	30.3
Sol kafir	----	28.2	37.7	32.9
Sunrise kafir	472	25.7	34.3	30.0
Atlas	899	21.7	25.5	23.6
Reed kafir	628	24.2	39.4	31.8
Hydro kafir	1023	30.9	40.6	35.8
Sharon kafir	813	26.9	35.8	31.4
Standard kafir	71	29.0	33.3	31.1
Bishop kafir	814	32.2	31.4	31.8
White darso (Wd. 52-29)	---	30.9	33.9	32.4
Darso	615	28.0	33.1	30.6
Average of 21 varieties		26.4	32.6	29.5

1/ Each yield figure is the average of 2 guarded 1/47th-acre plots.

SOUTHERN GREAT PLAINS FIELD STATION, WOODWARD (Cereal Agronomy, V. C. Hubbard) (Dec. 2)

November was dry and the temperatures were slightly below normal. A precipitation of 0.49 inch was recorded in two showers. October and November totaled 3.15 inches short of the 22-year Station average for those two months. The maximum, minimum, and mean temperatures were 81° on November 2, 10° on November 23 and 42°, respectively.

Some killing of fall-sown barley and oats occurred as a result of seven continuous nights of freezing temperatures.

The first firing in the rate-and-date-of-seeding experiment was noted on November 14 in the 4- and 5-peck rates seeded on September 15 on cropped land. The 3-peck rate started firing November 28. As usual, the November 15 seedings have not emerged by this date though most of the seed has germiniated.

Latent effects of the Woodward fire last summer are showing up in the nursery. Poor stands of some of the hybrids undoubtedly are due to overheated or soaked grain. Fortunately the extent of such damage is small.

Soil blowing has been a factor in the nursery, one portion of which has been cultivated three times. Bundles of sorghum stalks laid in the roadways and nursery alleys have aided appreciably in preventing soil movement.

KANSAS

FORT HAYS EXPERIMENT STATION, HAYS (Cereal Agronomy, A. F. Swanson) (Dec. 1)

The rainfall from July 1 to December 1 has amounted to 6.01 inches and is about 60 percent of normal. This territory is dry and wheat is in need of moisture. The season has been so dry that proper root development has not taken place. On fallowed land wheat has made fairly satisfactory growth in view of the dry fall, but on cropped land wheat is going into the winter in poor condition.

The sorghum crop has been weighed and the yields range from 0 to 27.0 bushels. The dry weather during the late summer and early fall greatly reduced the yields.

Palatability studies with different sorghum fodders are under way in which representative varieties of forage and grain sorghum planted on different dates and harvested in different stages of development are compared.

NORTH DAKOTA

UNITED STATES NORTHERN GREAT PLAINS FIELD STATION, MANDAN (Cereal Agronomy and Flax Breeding, J. C. Brinsmade, Jr.) (Dec. 1)

Cold winter weather prevailed in November in contrast to the mild weather in September and October. The mean temperature was 25°, which is 4° below the 25-year average for November. The maximum temperature was 51° and the minimum 8° below zero. The precipitation was 1.04 inches compared with the 25-year average of 0.54 inch. About four-fifths of this occurred during the first 11 days. The ground was covered with snow throughout most of the month. Winds in general were moderate but occasional high winds caused considerable drifting of snow. Some thawing has occurred so that most of the ground in exposed locations, especially where there is little or no vegetative cover, is now bare of snow. In places where there are trees, brush, or tall stubble to catch the snow, drifts still remain to a depth of 1 to 2 feet. This is especially noticeable where corn stalks or flax or wheat nursery rows were left unharvested.

Tabulation of data for the annual reports is practically completed.

DICKINSON SUBSTATION, DICKINSON (Cereal Agronomy, R. W. Smith) (Dec. 2)

The month of November ended with mild, thawing weather and the ground nearly bare after a total snowfall for the month of about 10 inches in addition to a rain of 0.63 inch on Nov. 1. The total recorded precipitation was 1.41 inches, or about 0.90 inch above normal. The total precipitation for the year to date is 16.47 inches, which is more than an inch above the normal precipitation for the entire year. The mean temperature for November was 24.1°, or 4.3° below normal. The minimum was 10° below zero on the 22d and 26th. The maximum was 53° on the 4th.

Winter wheat plots in standing cornstalks are still covered by snow. The winter nursery, however, is nearly bare of snow and the surface soil well soaked with melting snow water, which has soaked into the ground without loss. The wheat is still green but only about an inch high because of late emergence after light showers in October had moistened the extremely dry soil.

In assembling data on the spring wheat nursery the figures verify the observation, made before harvest, that grasshopper injury was more severe on rust-susceptible varieties. Based on the data obtained on 100 varieties grown in the rod-row nursery, the correlation between percentage of stem rust and estimated percentage of heads cut off by hoppers was r equals 0.75.